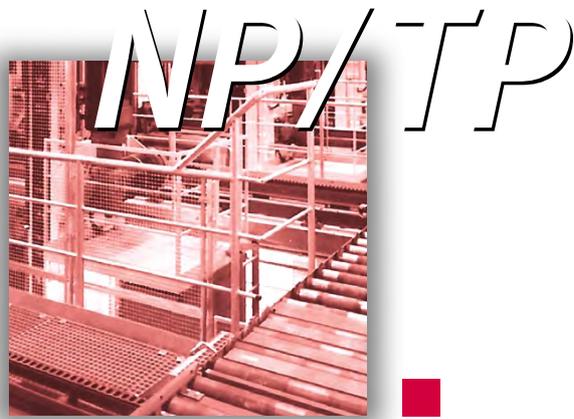


# Safety Switches



More than safety.



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**EUCHNER**

## Safety switches NP/TP

<b>General</b>	4
<b>Safety switches type series NP... without guard-locking device</b>	6
Advantages and features	6
Sample applications	7
Type NP... 1, 2 and 3 contact switching elements	8
<b>Safety switches type series TP... with guard-locking device</b>	10
Advantages and features	11
Operating principle	12
Sample applications	13
Type TP... 2 contact switching elements	14
Type TP...K 2 contact switching elements with increased overtravel	16
Type TP... 4 contact switching elements, without door monitoring contact	18
Type TP...K 4 contact switching elements, without door monitoring contact with increased overtravel	20
Type TP... 4 contact switching elements, with door monitoring contact	22
Type TP...K 4 contact switching elements, with door monitoring contact with increased overtravel	24
Type TP... 3 contact switching elements, with door unlock request contact	26
<b>Special versions</b>	28
Type TP... Switching elements with 4 positively driven NC contacts, with door monitoring contact	28
Type TP... With additional cable entry through the rear mounting face	29
Type TP... With emergency release through the rear mounting face, short actuation axis	30
Type TP... With emergency release through the rear mounting face, long actuation axis	31
Type TP... With M12 plug connectors	32
Type TP... With 2 M12 plug connectors	34
Type TP... With integrated AS-Interface Safety at Work	36

## Accessories

Actuators	38
Latch spring for increased retention force	41
Lockout bar	41
Insertion funnel NP/TP	42
Safety screws / Replacement screws	43
Lock	44
Adapter NP-K	45
Built-in LED	45
Cable glands	46
Plug connector with / without connection cable	47
Standard bolt for safety guards	48
Bolt with emergency release for escape from the hazardous area	50

## Appendix

Sample applications	52
Index	55

## General

Safety switches are safety-related machine control components in accordance with EN 954-1 and BGI 575. They are designed to safely interrupt the safety circuit or to prevent operation until any danger to the user has been eliminated.

Since safety switches prevent the operation of a system under certain conditions (generally for as long as the safety guard remains open), they are also described as interlocking devices. Interlocking devices are available with or without a guard-locking device.

According to EN 1088, electromechanical switches with no guard-locking device must be designed so that they positively switch off hazardous movement when safety guards are opened. They also prevent machines from being restarted when the safety guard is open.

EUCHNER safety switch NP is an example of an interlocking device without a guard-locking device.

In order to ensure that the process is not interrupted by unintentional opening of the safety guard, safety switches with electromechanical guard-locking devices are frequently used for process protection.

A guard-locking device can be used for personal protection, if the locking magnet is controlled by a standstill monitor and the safety switch has a fail-safe system for monitoring the solenoid.

With the aid of the interlocking monitoring system, EUCHNER safety switch TP meets all the necessary conditions for use for personal protection.

Safety switches NP and TP have been designed so that the same actuators can be used for both types of switch. For the design engineer, this offers the advantage of simplicity: If safety switches with and without a guard-locking device are used, only the drilling pattern for the switch needs to be modified. The actuator assembly remains the same. For different applications where hinged and sliding doors are used, EUCHNER offers straight or bent actuators. Actuators with rubber bushings facilitate flexible fastening or bedding of the actuator. Where there is a slight misalignment of the door, the actuator aligns itself to the switch actuator opening. When inserted, spring bearing actuators (so-called hinged actuators) fit almost friction-free. They are suitable for small hinged doors with a minimum radius of 100 mm.

In this context, the actuator with overtravel is a particularly interesting example. When the door is closed, this allows a certain amount of "play". In the closed state, the door can move slightly in the direction of the actuator. With protective doors this is particularly useful if they have a rubber buffer as a stop. An actuator with overtravel prevents unintentional stopping of the machine when the door or actuator (in the case of the NP switch) springs back.

In practice, a misalignment of the protective doors may be noticed when in operation. If preventative action is not taken, the actuator may be driven against the actuator head and damage it when the door is being closed.

To protect the actuation head, EUCHNER offers a metal funnel for safety switches NP and TP (see page 42). The use of this extra component increases the depth of actuator travel and an overtravel actuator does not relieve the system operator from the responsibility of maintaining the protective door alignment at regular intervals.

In order to prevent tampering, actuators must be positively connected to the protective door. It should not be possible to break the connection with simple tools. All EUCHNER actuators are supplied with safety screws.

The safety screws and both the straight and bent actuator, are made of stainless steel. This material property is particularly necessary for the food and chemical industries where the safety switch requirements are higher. With their highly resistant housing material (PA6, a glass-fiber reinforced thermoplastic) and the high degree of protection IP 67 for safety switches NP and TP, they can be used in the toughest environmental conditions.

The actuation head in safety switches NP and TP can easily be changed to any 90° position for the approach direction. Removing the 4 actuation head screws, the opening for the actuation head can be rotated to the required approach direction. If the actuation head is permanent in order to prevent tampering, it can be secured to the housing with safety screws (see chapter on accessories). If an adapter (see page 45) has been installed between the housing and the actuation head, safety switches NP can be tripped from the top by actuators with increased overtravel. The unused actuator opening can be sealed with the cap supplied.

With modern wiring concepts there is a trend towards plug-in connections. A switch with plug-connectors can be easily replaced during servicing work. EUCHNER offers safety switches NP and TP with 6-pole and 11-pole plug connectors. In addition to the relevant mating connectors, connectors with fixed cables are also offered as accessories. Safety switches with M12 plug connector are available on request. It is also possible to implement wiring in accordance with the DESINA concept.

Standard aluminum profiles are often used for safety guards. These are becoming increasingly prevalent due to the ease of installation, with a groove profile width of 40 mm and/or 45 mm becoming standard. EUCHNER safety switches NP and TP have the 40 mm width and can be secured flush to the barrier. Specially developed adapter plates (see pages 33 and 34) facilitate fast assembly of safety switches NP and TP with the standard profiles. The adapter plates can be used for all standard commercially available profiles.

A further move towards standardization was made with the market introduction of bolts (see pages 33 and 34). For safety switches NP and TP, EUCHNER offers bolts which can be fastened to standard profiles with little effort.

Pre-wired with connectors, safety switches NP and TP can offer maximum protection. The standard safety switches NP and TP types are BG, CAS, SAQ, SUVA and UL approved.

## **EUCHNER-Safety switches in the NP/TP series offer important advantages**

- ▶ Safety switches with separate actuator for protecting safety guards
- ▶ Fully insulated by glass fiber reinforced thermoplastic
- ▶ Degree of protection IP 67
- ▶ 4 Lateral approach directions can be changed quickly and conveniently
- ▶ 1 Approach direction from top
- ▶ Rear actuator head opening facilitates removal of dirt
- ▶ The same actuators can be used for NP and TP switches
- ▶ Actuators and safety screws are made of stainless steel
- ▶ Actuators with rubber bushings
- ▶ Increased actuator overtravel in all directions of approach
- ▶ Different switching elements available
- ▶ A number of different connection types are available
- ▶ Small switch width (NP : 35 mm, TP : 40 mm),
  - ▶ suitable for aluminum profile assembly
- ▶ Attractive design
- ▶ Approved by BG, CSA, SAQ, SUVA and UL



## Safety switches type series NP... without guard-locking device

### EUCHNER-Safety switches in the NP series ... offer important advantages

- ▶ Safety switches (without guard-locking device) with separate actuator for protecting safety guards
- ▶ Installation in accordance with EN 50047 (NP...AS) or alternatively with 40 mm hole spacing (NP...AB)
- ▶ Small switch width (35 mm)
  - ▶ Ideal for profile assembly
- ▶ Option: with the adapter set, an upgrade for *increased overtravel from the top* is available
- ▶ Switching elements with 1, 2 or 3 contact elements
- ▶ 10 N Retention force and/or 30 N with latch spring
- ▶ Connection using cable entry M20 x 1.5 or 6-pole plug connector
- ▶ Slide bolts available

### Approach direction can be changed quickly



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Sample applications for safety switches in the NP series ...

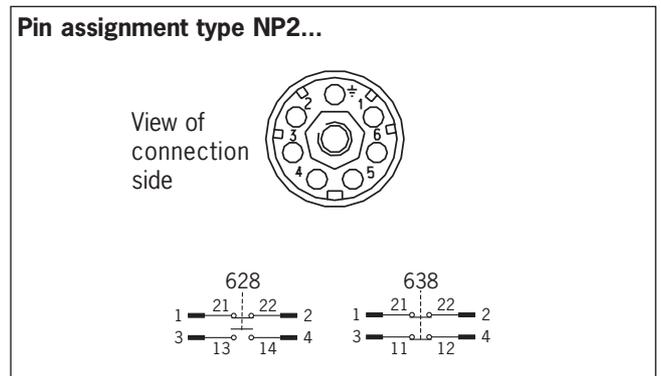
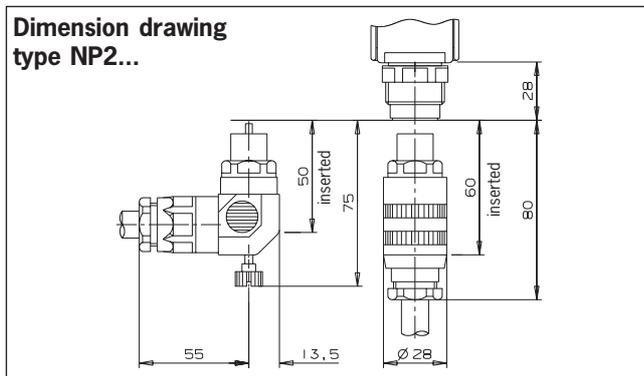


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## Technical data

Parameters	Value				Unit
Housing material	Glass fiber reinforced thermoplastic				
Degree of protection to IEC 60529	IP 67 for M20x1.5 / IP 65 for SR6				
Mounting position	optional				
Mechanical service life	1 x 10 <sup>6</sup> switching cycles				
Ambient temperature	- 20 to +80				°C
Approach speed, max.	20				m/min
Weight	approx. 0.11				kg
Switching element	618	628	638	648	
Contact elements	1 NC ⊖	1 NC ⊖ + 1 NO	2 NC ⊖	2 NC ⊖ + 1 NO	
Switching principle	Dependent action contact element				
Contact material	Silver alloy				
Rated impulse withstand voltage U <sub>imp</sub>	2.5				kV
Rated insulation voltage U <sub>i</sub>	NP1: U <sub>i</sub> = 400 / NP2: U <sub>i</sub> = 250				V <sub>≒</sub>
Utilization category to IEC 947-5-1	AC-15 le 4 A Ue 230 V / DC-13 le 4 A Ue 24 V				
Switching voltage min. at 10 mA	24				V
Switching current min. at 24 V	30				mA
Conventional thermal current I <sub>th</sub>	4				A
Short circuit protection (control circuit fuse)	to IEC 60269-1: 4 A gG				
Connection type NP1...	Screw terminal, M20x1.5				
Connection type NP2...	Plug connector SR6				
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm <sup>2</sup>				
<b>Insertion depth</b> (necessary minimum travel + permissible overtravel)	Standard actuator		Overtravel actuator		
Approach direction side (h)	28 + 2		28 + 7		mm
Approach direction from top (v)	29.5 + 1.5		29.5 + 7 Only with adapter NP-K Cat. No. 074 578 / page 45		mm



## Ordering table

Type series / Connection type / Installation method	Switching element	Increased over-travel	Type designation	Contact elements	Cat. No.
<b>NP1...AS-M</b> Cable entry Fitting to EN 50047	618	<b>A</b> (side)	NP1-618AS-M	1 pos. driven NC	083 685
	628		NP1-628AS-M	1 pos. driven NC + 1 NO	083 688
	638		NP1-638AS-M	2 pos. driven NC	083 691
	648		NP1-648AS-M	2 pos. driven NC + 1 NO	082 280
<b>NP1...AB-M</b> Cable entry 40 mm hole spacing	618		NP1-618AB-M	1 pos. driven NC	083 680
	628		NP1-628AB-M	1 pos. driven NC + 1 NO	083 686
	638		NP1-638AB-M	2 pos. driven NC	083 690
	648		NP1-648AB-M	2 pos. driven NC + 1 NO	082 276
<b>NP2...AS</b> Plug connector SR6 Fitting to EN 50047	628	<b>A</b> (side)	NP2-628AS	1 pos. driven NC + 1 NO	059 447
	638		NP2-638AS	2 pos. driven NC	059 449
<b>NP2...AB</b> Plug connector SR6 40 mm hole spacing	628		NP2-628AB	1 pos. driven NC + 1 NO	059 448
	638		NP2-638AB	2 pos. driven NC	059 450

Ordering example: NP1, switching element 638, increased over-travel, type A, 40 mm hole spacing (B), cable entry M  
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 type NP1-638AB-M  
 Cat. No. 083 690

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## Safety switches type series TP... with guard-locking device

EUCHNER safety switch TP has a built-in solenoid (a guard-locking device) which is designed to provide process and personal protection.

According to standard EN 1088, switches with a guard-locking device must have a mechanical unlocking mechanism. This mechanism must allow manual unlocking of the guard-locking device from the machine's access side with a suitable tool or key. When the tool or key is removed, the mechanical unlocking mechanism must return automatically to the starting position or remain in a safe position.

The mechanical unlocking mechanism for safety switch TP meets these requirements.

When delivered, the mechanical unlocking device is sealed to prevent tampering.

EUCHNER offers an optional lock as an accessory for the mechanical unlocking mechanism; this can be retro-fitted to the safety switch cover. Authorized personnel can unlock the mechanical unlocking device with a key to interrupt the safety circuit. When the safety switch is unlocked, the operator can access the machine.

If the hazardous area behind the safety device can be accessed, measures must be taken to ensure that anyone who is accidentally locked in (e.g. if a door closes to), can automatically free themselves. Safety switches TP have an optional emergency release to the rear that can be operated by a rotary lever. EUCHNER also offers appropriate bolts for such applications (for an exact description see page 50).

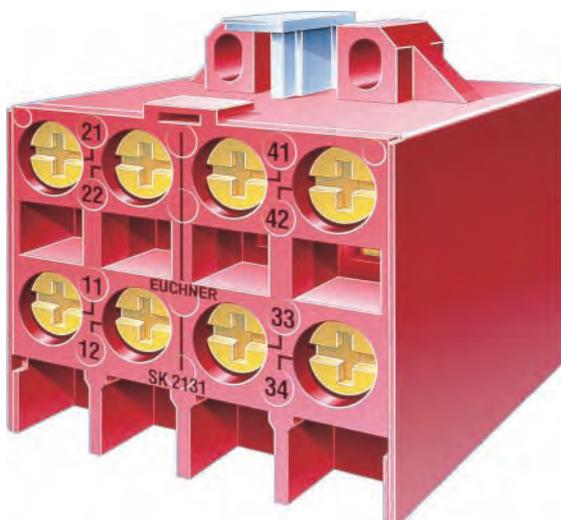
For safety switches TP, a choice of three M20x1.5 cable entries are available to the user. Depending on the switch alignment, a convenient cable entry can be used.

In the case of variant TP...C1761 (see page 29), the switch has an extra cable entry to the rear. This allows the cable to be fed directly to the switch through a drill hole in the safety guard. A flat seal between the rear of the housing and the mounting face protects from the penetration of dirt.

Safety switches TP are also available with plug connectors. If an M12 plug connector (8-pole) is used, it can be connected directly to an AS-Interface module. Variants with M12 plug connectors wired in accordance with DESINA are also available.

## Safety switches TP... with different contact elements

- ▶ **2 contact switching elements**
  - ▶ 1 NC contact + 1 NO contact
  - ▶ 2 NC contacts
- ▶ **Switching elements with 3 contact elements**  
(with door unlock request contact)
  - ▶ 2 NC contacts + 1 NO contact
- ▶ **4 contact switching elements**
  - ▶ 2 NC contacts + 2 NO contacts
  - ▶ 3 NC contacts + 1 NO contact
  - ▶ 4 NC contacts



## Switching elements with 4 contact elements offer important advantages

- ▶ Versatile connection options
  - ▶ Only one switch for several applications
- ▶ Installation in the conventional EUCHNER housing
  - ▶ No conversion problems
  - ▶ Familiar housing dimensions and drilling pattern
- ▶ Fewer types
  - ▶ Savings in storage costs
- ▶ Redundant (twin-channel) integration into the safety circuit through the use of 2 electrically separated positively driven NC contacts. When wiring several safety switches in series, redundant integration into the safety circuit is also possible.
  - ▶ Greater safety for the user
  - ▶ High control category (according to EN 954-1)
- ▶ Approval for **BG, CSA, SAQ, SUVA, UL**

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## EUCHNER-Safety switches in the TP series ... offer important advantages

- ▶ Safety switches with separate actuator and guard-locking device for protecting safety guards
- ▶ Retention force 1200 N in locked state
- ▶ Mechanical auxiliary unlocking mechanism from the front
- ▶ Mechanical key unlocking mechanism from the front (optional, retro-fit)
- ▶ Emergency release through the rear mounting face available as an option
  - ▶ User-operated mechanism for emergency escape from hazardous area
- ▶ A voltage rectifier is placed before the solenoid coil
  - ▶ Voltage peaks are avoided when the solenoid is switched
- ▶ Large selection of switching elements
- ▶ Switch with door unlock request contact available
  - ▶ An unlock command can be issued locally without a stop button
- ▶ 3 cable entries M20 x 1.5 or plug connector (6 or 12-pole)
- ▶ Switch with M12 plug connector suitable for direct connection to AS-Interface module
- ▶ Slide bolts available

## Approach direction can be changed quickly



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## Operating principle

The sectional drawings show safety switch TP in the three basic positions:

- ▶ Doors closed and locked
- ▶ Doors closed and unlocked
- ▶ Doors open and unlocked

### Doors closed and locked

If the solenoid plunger is in the top position (right illustration), this prevents rotation of the cam disc in the actuation head. The actuator or safety guard is therefore locked. When the plunger is in this position, positively driven NC contacts 21-22 and 41-42 are held in the closed position. This means that the machine protected by the safety circuit can be started.

### Doors closed and unlocked

If the solenoid is switched on (in the case of safety switches TP...4131), the cam disc blocking is lifted and the NC contacts (21-22 and 41-42) are opened at the same time. NO contact 33-34 signals that the interlocking solenoid is unlocked.

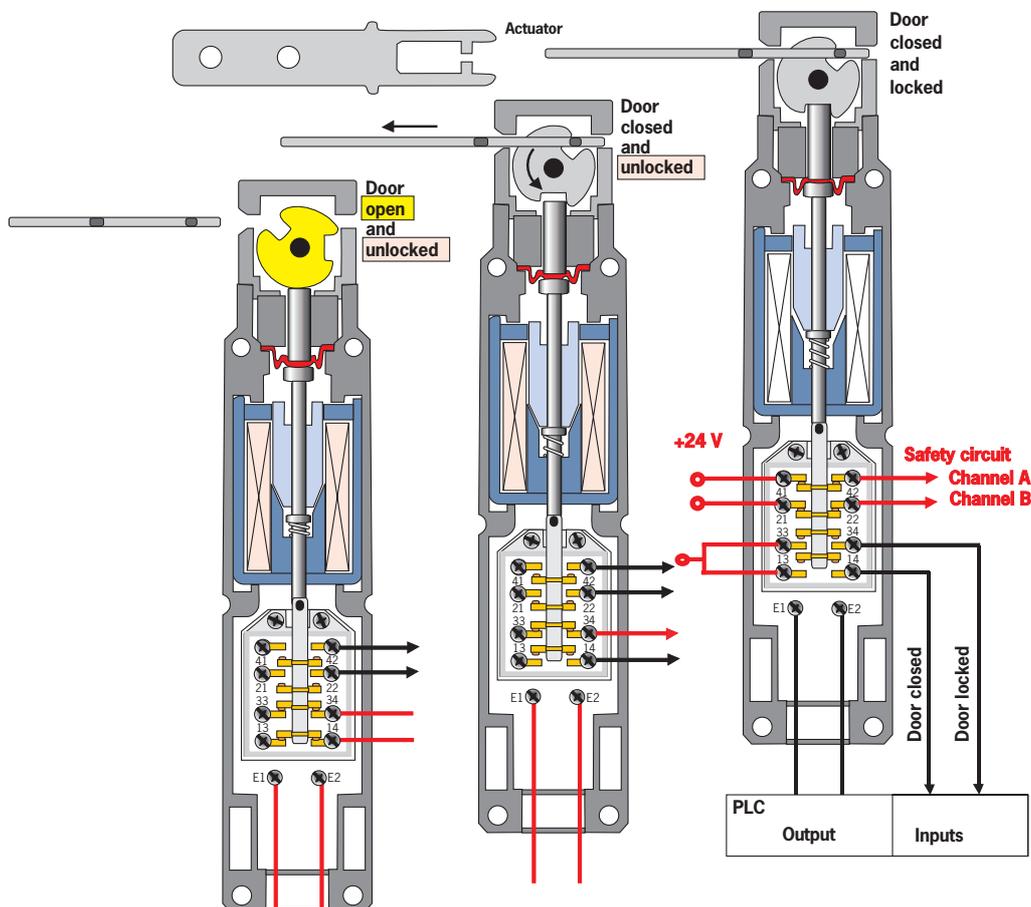
### Doors open and unlocked

When the actuator is being removed, the cam disc is rotated. Because of its eccentric contour, the plunger is pressed fully down. NO contact 13-14 closes and sends a signal to the control that the safety guard is open.

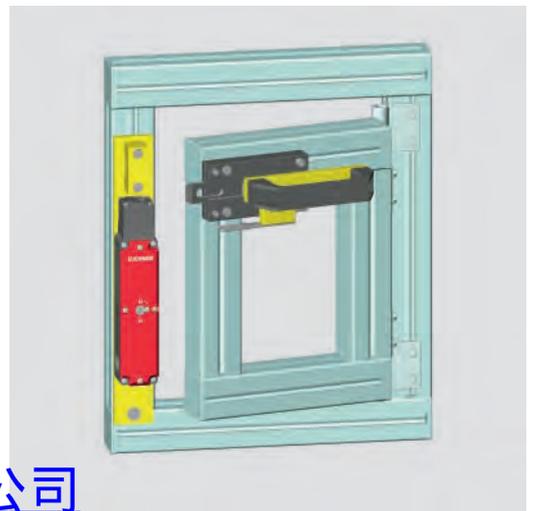
Since the solenoid plunger and the cam disc are positively connected, the NC contacts 21-22 & 41-42 remain securely open. This design feature of the guard-locking device ensures that the locking mechanism (solenoid plunger) cannot lock if the safety guard is open. This is also mentioned in BGI 575 **Protection Against Unintentional Closing**.

The state of a switching element can be polled because of the sequential switching pattern (solenoid plunger can adopt three basic positions)

In consequence of this technology, EUCHNER's safety switch TP has a slender structural design. It is ideally suited to applications for which small structural switch designs are essential.



Applications for Type Series TP... Safety Switches

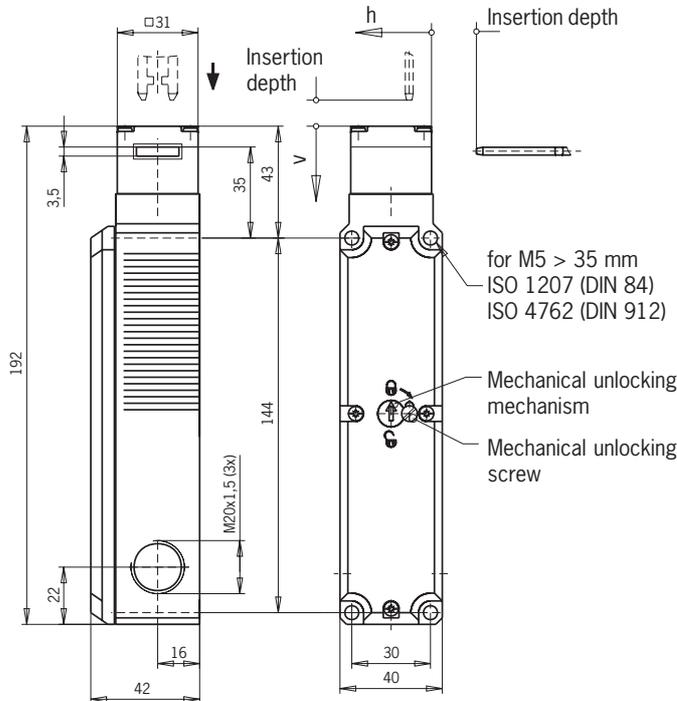


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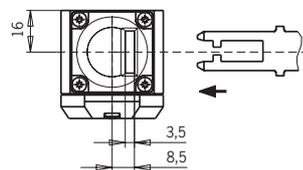
## Safety switches type series TP...

- ▶ With 2 contact elements
- ▶ With door monitoring contact for TP3.../TP4...
- ▶ Cable entry M20x1.5 or Plug connector SR6 (relevant plug connectors see page 47)

### Dimension drawing type TP...M

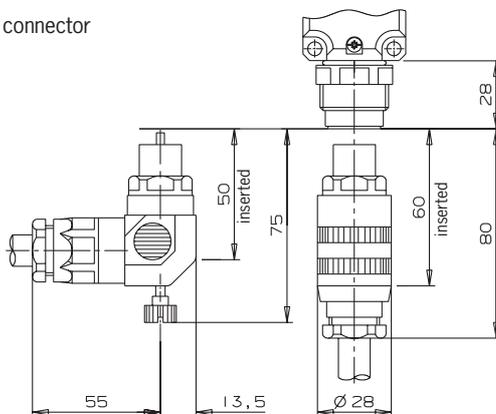


Please order actuator separately (see pages 38 to 40).



### Dimension drawing type TP...SR6

Please order plug connector separately (see page 47).



### Installation notes

The safety switch and actuator must be installed properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 43) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

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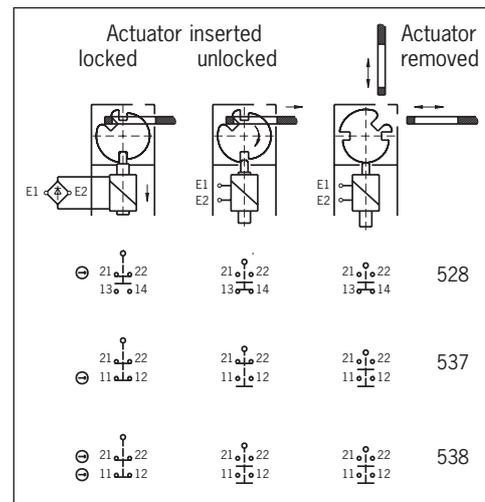


\* with cable entry M, 24 V DC / 110 V AC

### Switching elements

(dependent action contact element)

- 528** 1 positively driven NC contact + 1 NO contact
- 537** 1 positively driven NC contact + 1 NC contact as door monitoring contact
- 538** 2 positively driven NC contacts



### Locking methods

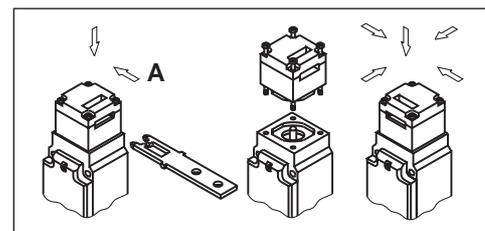
**TP1.../ TP3...:** Actuator inserted, mechanically locked, unlock by applying voltage.  
**TP2.../ TP4...:** Lock by applying voltage.

### Mechanical unlocking mechanism

Safety switches can be unlocked by using the mechanical unlocking mechanism in the event of power failure, for example. The mechanical unlocking mechanism has to be sealed to prevent tampering (for example with sealing lacquer).

### Changing the approach direction

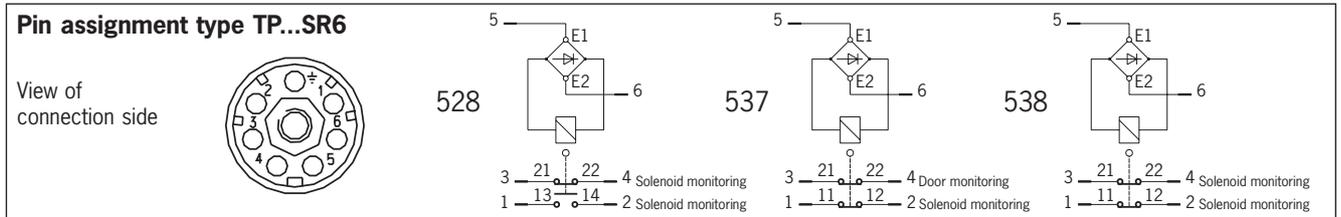
Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction A.



⚠ The complete safety switch must be replaced in the event of faults.

## Technical data

Parameters	Value			Unit
Housing material	Glass fiber reinforced thermoplastic			
Degree of protection to IEC 60529	TP...M: IP 67 / TP...SR6: IP 65			
Mounting position	optional			
Mechanical service life	1 x 10 <sup>6</sup> switching cycles			
Ambient temperature	- 20 to + 55			°C
Approach speed, max.	20			m/min
Insertion/extraction force (not locked)	TP1, TP2: approx. 8 / TP3: approx. 10 / TP4: approx. 15			N
Retention force when locked	1200			N
Weight	approx. 0.5			kg
Switching element	528	537	538	
Contact elements	1 NC ⊖ + 1 NO	1 NC ⊕ + 1 NC	2 NC ⊖	
Switching principle	Dependent action contact element			
Contact material	silver alloy, gold flashed			
Rated impulse withstand voltage U <sub>imp</sub>	2.5			kV
Rated insulation voltage U <sub>i</sub>	250			V <sub>≅</sub>
Utilization category to IEC 947-5-1	AC-15 I <sub>e</sub> 6 A U <sub>e</sub> 230 V / DC-13 I <sub>e</sub> 6 A U <sub>e</sub> 24 V			
Switching voltage min. at 10 mA	12			V
Switching current min. at 24 V	10			mA
Conventional thermal current I <sub>th</sub>	6			A
Short circuit protection (control circuit fuse)	to IEC 60269-1: 6 A gG			
Connection method type TP...M	Screw terminal, M20x1.5			
Connection method type TP...SR6	Plug connector SR6			
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm <sup>2</sup>			mm <sup>2</sup>
<b>Solenoid</b>				
Connection	reverse polarity protected, integrated bridge rectifier			
Solenoid operating voltage	24 V AC/DC, 110 V AC, 230 V AC (all -15% / +10%)			
Duty cycle	100			%
Power consumption	8			W
<b>Insertion depth</b> (necessary minimum travel + permissible overtravel)	Standard actuator		Overtravel actuator	
Approach direction side (h)	28 + 2		28 + 7	
Approach direction from top (v)	29.5 + 1.5		-	



## Ordering table

Type series / Version / Locking method / Connection type	Switching element	Increased over- travel	Type designation	Cat. No.		
				Solenoid operating voltage		
				024	110	230
TP1-...M / TP3-...M Mechanical locking, Cable entry	528	A (side)	TP1-528A...M	084 295	084 300	084 304
	537		TP3-537A...M	084 336	084 337	084 338
	538		TP1-538A...M	084 310	084 315	084 320
TP2-...M / TP4-...M Electrical locking, Cable entry	528		TP2-528A...M	084 325	084 330	084 332
	537		TP4-537A...M	084 339	084 340	084 341
	538		TP2-538A...M	084 333	084 334	084 335
TP1-...SR6 / TP3-...SR6 Mechanical locking, Plug connector SR6	528	A (side)	TP1-528A...SR6	087 431	087 435	087 438
	537		TP3-537A...SR6	087 434	087 437	087 440
	538		TP1-538A...SR6	087 433	087 436	087 439
TP2-...SR6 / TP4-...SR6 Electrical locking, Plug connector SR6	528		TP2-528A...SR6	087 441	087 444	087 448
	537		TP4-537A...SR6	087 443	087 447	087 450
	538		TP2-538A...SR6	087 442	087 446	087 449

**Ordering example:** TP2, electr. locking, switching element 528, increased overtravel side A,

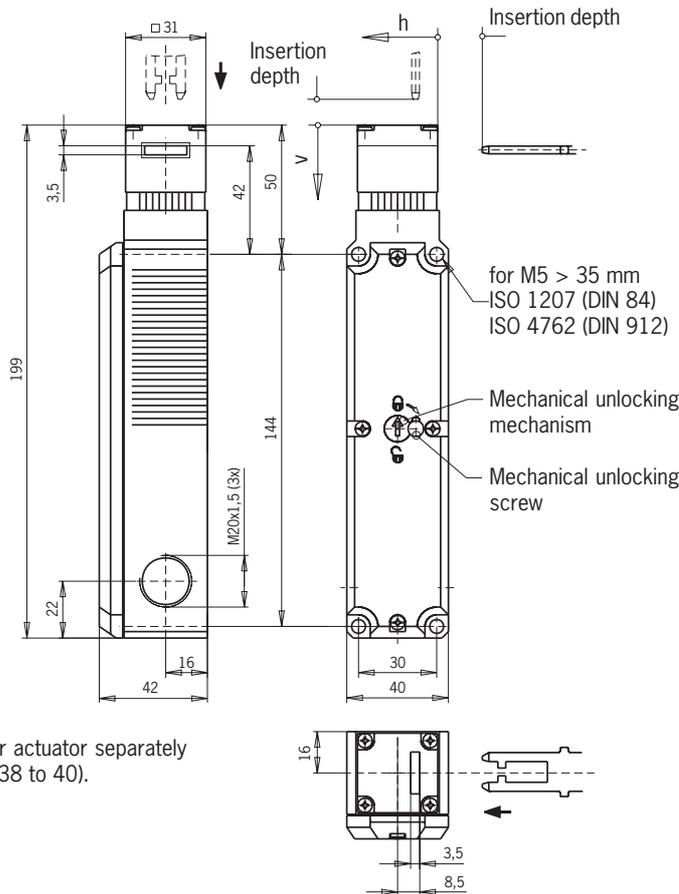
solenoid operating voltage 230 V AC, cable entry M  
 深圳市卡普特机电设备有限公司  
 Type TP2-528A-230 V  
 0755-21513506 Sales@ttcie.com

Cat. No. 084 332

## Safety switches type series TP..K..

- ▶ Increased overtravel with approach direction from top
- ▶ With 2 contact elements
- ▶ With door monitoring contact for TP3.../TP4...
- ▶ Cable entry M20x1.5 or Plug connector SR6 (relevant plug connectors see page 47)

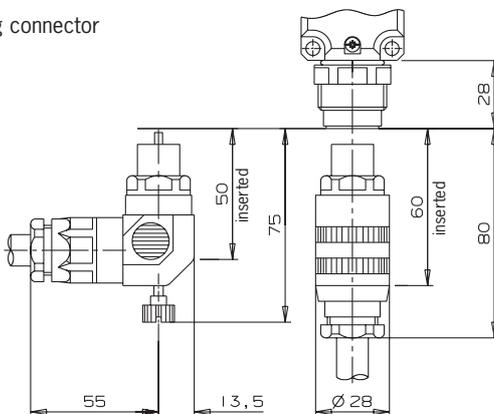
### Dimension drawing type TP...M



Please order actuator separately (see pages 38 to 40).

### Dimension drawing type TP...SR6

Please order plug connector separately (see page 47).



### Installation notes

The safety switch and actuator must be installed properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 43) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

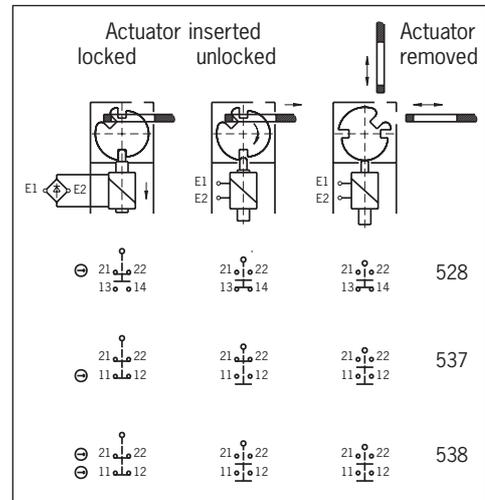


\* with cable entry M, 24 V DC / 110 V AC

### Switching elements

(dependent action contact element)

- 528** 1 positively driven NC contact + 1 NO contact
- 537** 1 positively driven NC contact + 1 NC contact as door monitoring contact
- 538** 2 positively driven NC contacts



### Locking methods

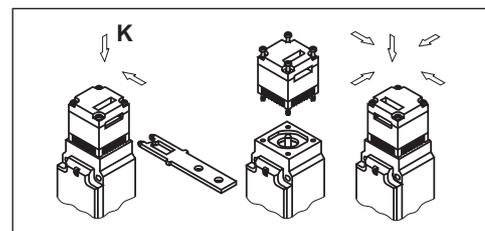
**TP1.../ TP3...:** Actuator inserted, mechanically locked, unlock by applying voltage.  
**TP2.../ TP4...:** Lock by applying voltage.

### Mechanical unlocking mechanism

Safety switches can be unlocked by means of the mechanical unlocking mechanism in the event of power failure, for example. The mechanical unlocking mechanism has to be sealed to prevent tampering (for example with sealing lacquer).

### Changing the approach direction

Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction K.



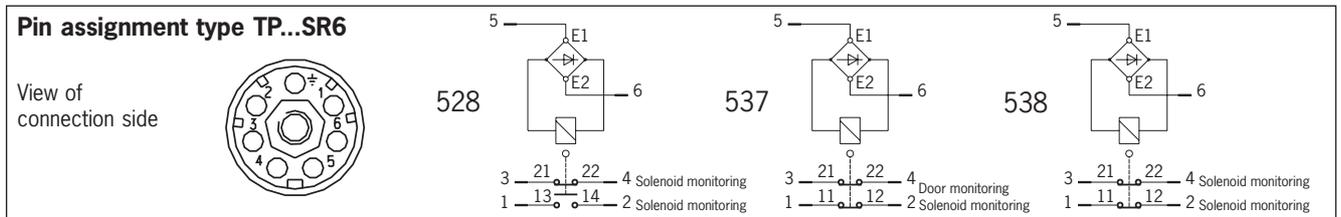
⚠ The complete safety switch must be replaced in the event of faults.

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## Technical data

Parameters	Value			Unit
Housing material	Glass fiber reinforced thermoplastic			
Degree of protection to IEC 60529	TP...M: IP 67 / TP...SR6: IP 65			
Mounting position	optional			
Mechanical service life	1 x 10 <sup>6</sup> switching cycles			
Ambient temperature	- 20 to + 55			°C
Approach speed, max.	20			m/min
Insertion/extraction force (not locked)	approx. 8			N
Retention force when locked	1200			N
Weight	approx. 0.5			kg
Switching element	528	537	538	
Contact elements	1 NC ⊖ + 1 NO	1 NC ⊕ + 1 NC	2 NC ⊖	
Switching principle	Dependent action contact element			
Contact material	silver alloy, gold flashed			
Rated impulse withstand voltage U <sub>imp</sub>	2.5			kV
Rated insulation voltage U <sub>i</sub>	250			V <sub>≒</sub>
Utilization category to IEC 947-5-1	AC-15 I <sub>e</sub> 6 A U <sub>e</sub> 230 V / DC-13 I <sub>e</sub> 6 A U <sub>e</sub> 24 V			
Switching voltage min. at 10 mA	12			V
Switching current min. at 24 V	10			mA
Conventional thermal current I <sub>th</sub>	6			A
Short circuit protection (control circuit fuse)	to IEC 60269-1: 6 A gG			
Connection method type TP...M	Screw terminal, M20x1.5			
Connection method type TP...SR6	Plug connector SR6			
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm <sup>2</sup>			mm <sup>2</sup>
<b>Solenoid</b>				
Connection	reverse polarity protected, integrated bridge rectifier			
Solenoid operating voltage	24 V AC/DC, 110 V AC, 230 V AC (all -15% / +10%)			
Duty cycle	100			%
Power consumption	8			W
<b>Insertion depth</b> (necessary minimum travel + permissible overtravel)	Standard actuator		Overtravel actuator	
Approach direction side (h)	28 + 2		28 + 7	
Approach direction from top (v)	29.5 + 1.5		29.5 + 7	



## Ordering table

Type series / Version / Locking method / Connection type	Switching element	Increased over- travel	Type designation	Cat. No.		
				Solenoid operating voltage		
				024	110	230
<b>TP1-...M / TP3-...M</b> Mechanical locking, Cable entry	<b>528</b>	K (side + top)	TP1-528K...M	084 342	on request	on request
	<b>537</b>		TP3-537K...M	084 347		
	<b>538</b>		TP1-538K...M	084 343		
<b>TP2-...M / TP4-...M</b> Electrical locking, Cable entry	<b>528</b>		TP2-528K...M	084 344		
	<b>537</b>		TP4-537K...M	084 348		
	<b>538</b>		TP2-538K...M	084 346		
<b>TP1-...SR6 / TP3-...SR6</b> Mechanical locking, Plug connector SR6	<b>528</b>	K (side + top)	TP1-528K...SR6	088 210	on request	on request
	<b>537</b>		TP3-537K...SR6	088 213		
	<b>538</b>		TP1-538K...SR6	088 212		
<b>TP2-...SR6 / TP4-...SR6</b> Electrical locking, Plug connector SR6	<b>528</b>		TP2-528K...SR6	088 214		
	<b>537</b>		TP4-537K...SR6	088 216		
	<b>538</b>		TP2-538K...SR6	088 215		

**Ordering example:** TP2, electr. locking, switching element 528, increased overtravel side and top K, solenoid operating voltage 24 V AC/DC, cable entry M

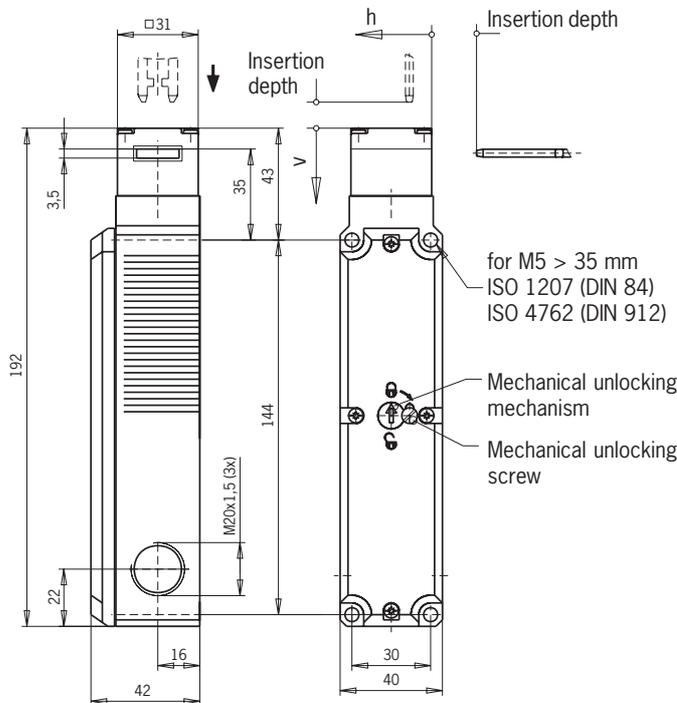
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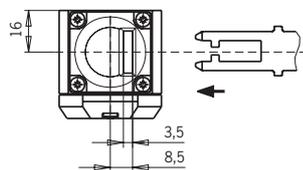
## Safety switches type series TP...

- ▶ With 4 contact elements, without door monitoring contact
- ▶ Cable entry M20x1.5 or Plug connector SR11 (relevant plug connectors see page 47)

### Dimension drawing type TP...M

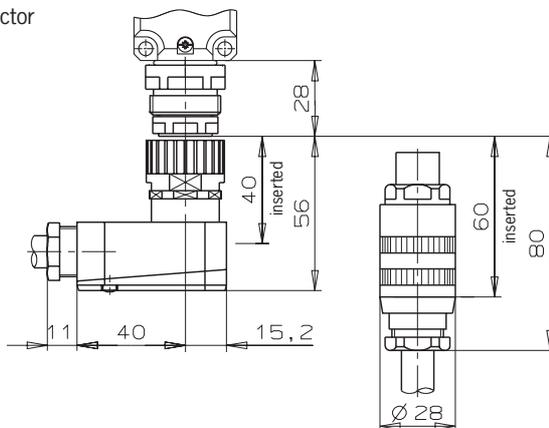


Please order actuator separately (see pages 38 to 40).



### Dimension drawing type TP...SR11

Please order plug connector separately (see page 47).



### Installation notes

The safety switch and actuator must be installed properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 43) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

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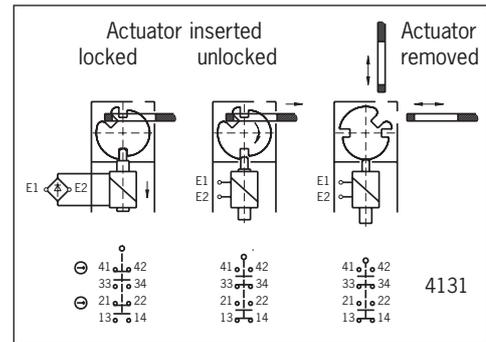


\* with cable entry M, 24 V DC / 110 V AC

### Switching elements

(dependent action contact element)

**4131** 2 positively driven NC contacts + 2 NO contacts



### Locking methods

**TP1...**: Actuator inserted, mechanically locked, unlock by applying voltage.

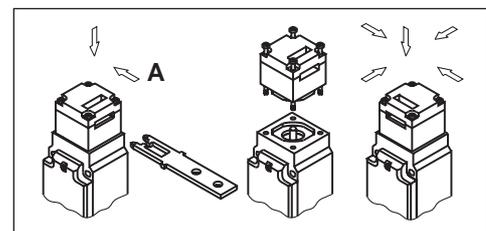
**TP2...**: Lock by applying voltage.

### Mechanical unlocking mechanism

Safety switches can be unlocked by means of the mechanical unlocking mechanism in the event of power failure, for example. The mechanical unlocking mechanism has to be sealed to prevent tampering (for example with sealing lacquer).

### Changing the approach direction

Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction A.



⚠ The complete safety switch must be replaced in the event of faults.

## Technical data

Parameters	Value	Unit	
Housing material	Glass fiber reinforced thermoplastic		
Degree of protection to IEC 60529	TP...M: IP 67 / TP...SR11: IP 65		
Mounting position	optional		
Mechanical service life	1 x 10 <sup>6</sup> switching cycles		
Ambient temperature	- 20 to + 55	°C	
Approach speed, max.	20	m/min	
Insertion/extraction force (not locked)	approx. 8	N	
Retention force when locked	1200	N	
Weight	approx. 0.5	kg	
Switching element	4131		
Contact elements	2 NC $\ominus$ + 2 NO		
Switching principle	Dependent action contact element		
Contact material	silver alloy, gold flashed		
Rated impulse withstand voltage $U_{imp}$	TP...M: $U_{imp} = 2.5$ / TP...SR11: $U_{imp} = 1,5$	kV	
Rated insulation voltage $U_i$	TP...M: $U_i = 250$ / TP...SR11: $U_i = 50$	V <sub>≅</sub>	
Utilization category to IEC 947-5-1	TP...M: AC-15 I <sub>e</sub> 6 A U <sub>e</sub> 230 V / DC-13 I <sub>e</sub> 6 A U <sub>e</sub> 24 V TP...SR11: 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		
Switching voltage min. at 10 mA	12	V	
Switching current min. at 24 V	10	mA	
Conventional thermal current I <sub>th</sub>	TP...M: 6 / TP...SR11: 4	A	
Short circuit protection (control circuit fuse)	to IEC 60269-1, TP ...M: 6 A gG / TP...SR11: 4 A gG		
Connection method type TP...M	Screw terminal, M20x1.5		
Connection method type TP...SR11	Plug connector SR11		
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm <sup>2</sup>	mm <sup>2</sup>	
<b>Solenoid</b>			
Connection	reverse polarity protected, integrated bridge rectifier		
Solenoid operating voltage	24 V AC/DC, 110 V AC, 230 V AC (all -15% / +10%)		
Duty cycle	100	%	
Power consumption	8	W	
<b>Insertion depth</b> (necessary minimum travel + permissible overtravel)	Standard actuator	Overtravel actuator	
Approach direction side (h)	28 + 2	28 + 7	mm
Approach direction from top (v)	29.5 + 1.5	-	mm

**Pin assignment type TP...SR11**

View of connection side

4131

7 41 42 8 Solenoid monitoring  
5 33 34 6 Solenoid monitoring  
3 21 22 4 Solenoid monitoring  
1 13 14 2 Solenoid monitoring

## Ordering table

Type series / Version / Locking method / Connection type	Switching element	Increased over- travel	Type designation	Cat. No.		
				Solenoid operating voltage		
				024	110	230
<b>TP1-...M</b> Mechanical locking, Cable entry	<b>4131</b>	<b>A</b> (side)	TP1-4131A...M	084 115	084 116	084 117
<b>TP2-...M</b> Electrical locking, Cable entry			TP2-4131A...M	084 125	084 126	084 128
<b>TP1-...SR11</b> Mechanical locking, Plug connector SR11	<b>4131</b>	<b>A</b> (side)	TP1-4131A...SR11	088 202	-	-
<b>TP2-...SR11</b> Electrical locking, Plug connector SR11			TP2-4131A...SR11	088 203	-	-

**Ordering example:** TP2, electr. locking, switching element **4131**, increased overtravel side **A**,

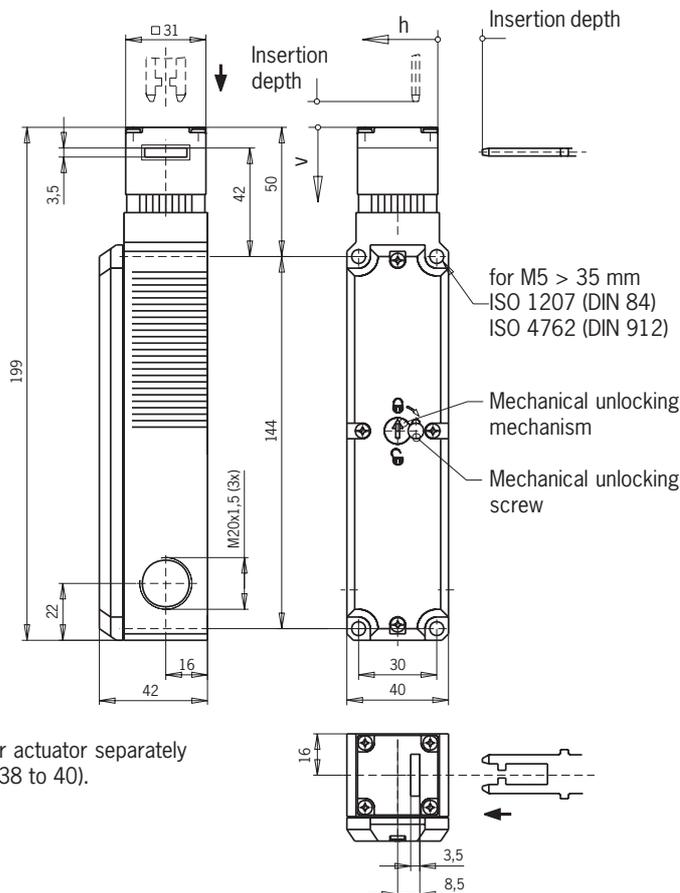
solenoïd operating voltage **024** V AC/DC, cable entry **M**  
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Cat. No. 084 125

## Safety switches type series TP..K..

- ▶ Increased overtravel with approach direction from top
- ▶ With 4 contact elements, without door monitoring contact
- ▶ Cable entry M20x1.5 or Plug connector SR11 (relevant plug connectors see page 47)

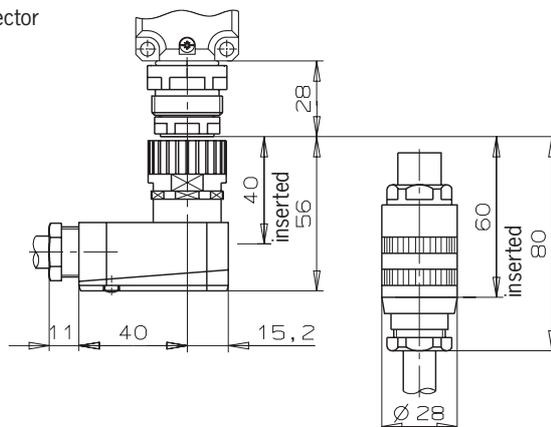
### Dimension drawing type TP...M



Please order actuator separately (see pages 38 to 40).

### Dimension drawing type TP...SR11

Please order plug connector separately (see page 47).



### Installation notes

The safety switch and actuator must be installed properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 43) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

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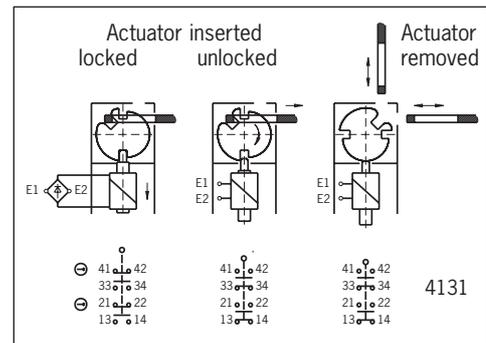


\* with cable entry M, 24 V DC / 110 V AC

### Switching elements

(dependent action contact element)

**4131** 2 positively driven NC contacts + 2 NO contacts



### Locking methods

**TP1...** Actuator inserted, mechanically locked, unlock by applying voltage.

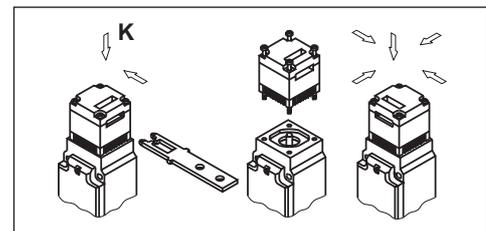
**TP2...** Lock by applying voltage.

### Mechanical unlocking mechanism

Safety switches can be unlocked by means of the mechanical unlocking mechanism in the event of power failure, for example. The mechanical unlocking mechanism has to be sealed to prevent tampering (for example with sealing lacquer).

### Changing the approach direction

Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction K.



⚠ The complete safety switch must be replaced in the event of faults.

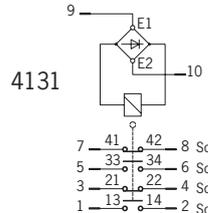
## Technical data

Parameters	Value	Unit	
Housing material	Glass fiber reinforced thermoplastic		
Degree of protection to IEC 60529	TP...M: IP 67 / TP...SR11: IP 65		
Mounting position	optional		
Mechanical service life	1 x 10 <sup>6</sup> switching cycles		
Ambient temperature	- 20 to + 55	°C	
Approach speed, max.	20	m/min	
Insertion/extraction force (not locked)	approx. 8	N	
Retention force when locked	1200	N	
Weight	approx. 0.5	kg	
Switching element	4131		
Contact elements	2 NC $\ominus$ + 2 NO		
Switching principle	Dependent action contact element		
Contact material	silver alloy, gold flashed		
Rated impulse withstand voltage U <sub>imp</sub>	TP...M: U <sub>imp</sub> = 2.5 / TP...SR11: U <sub>imp</sub> = 1,5	kV	
Rated insulation voltage U <sub>i</sub>	TP...M: U <sub>i</sub> = 250 / TP...SR11: U <sub>i</sub> = 50	V <sub>≅</sub>	
Utilization category to IEC 947-5-1	TP...M: AC-15 I <sub>e</sub> 6 A U <sub>e</sub> 230 V / DC-13 I <sub>e</sub> 6 A U <sub>e</sub> 24 V TP...SR11: 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		
Switching voltage min. at 10 mA	12	V	
Switching current min. at 24 V	10	mA	
Conventional thermal current I <sub>th</sub>	TP...M: 6 / TP...SR11: 4	A	
Short circuit protection (control circuit fuse)	to IEC 60269-1, TP ...M: 6 A gG / TP...SR11: 4 A gG		
Connection method type TP...M	Screw terminal, M20x1.5		
Connection method type TP...SR11	Plug connector SR11		
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm <sup>2</sup>	mm <sup>2</sup>	
<b>Solenoid</b>			
Connection	reverse polarity protected, integrated bridge rectifier		
Solenoid operating voltage	24 V AC/DC, 110 V AC, 230 V AC (all -15% / +10%)		
Duty cycle	100	%	
Power consumption	8	W	
<b>Insertion depth</b> (necessary minimum travel + permissible overtravel)	Standard actuator	Overtravel actuator	
Approach direction side (h)	28 + 2	28 + 7	mm
Approach direction from top (v)	29.5 + 1.5	29.5 + 7	mm

**Pin assignment type TP...SR11**

View of connection side





4131

7 41 42 8 Solenoid monitoring  
5 33 34 6 Solenoid monitoring  
3 21 22 4 Solenoid monitoring  
1 13 14 2 Solenoid monitoring

## Ordering table

Type series / Version / Locking method / Connection type	Switching element	Increased over-travel	Type designation	Cat. No.		
				Solenoid operating voltage		
				024	110	230
<b>TP1-...M</b> Mechanical locking, Cable entry	<b>4131</b>	<b>K</b> (side + top)	TP1-4131K...M	084 150	084 254	084 255
<b>TP2-...M</b> Electrical locking, Cable entry			TP2-4131K...M	084 253	on request	on request
<b>TP1-...SR11</b> Mechanical locking, Plug connector SR11	<b>4131</b>	<b>K</b> (side + top)	TP1-4131K...SR11	088 217	-	-
<b>TP2-...SR11</b> Electrical locking, Plug connector SR11			TP2-4131K...SR11	088 218	-	-

**Ordering example:** TP2, electr. locking, switching element **4131**, increased overtravel side

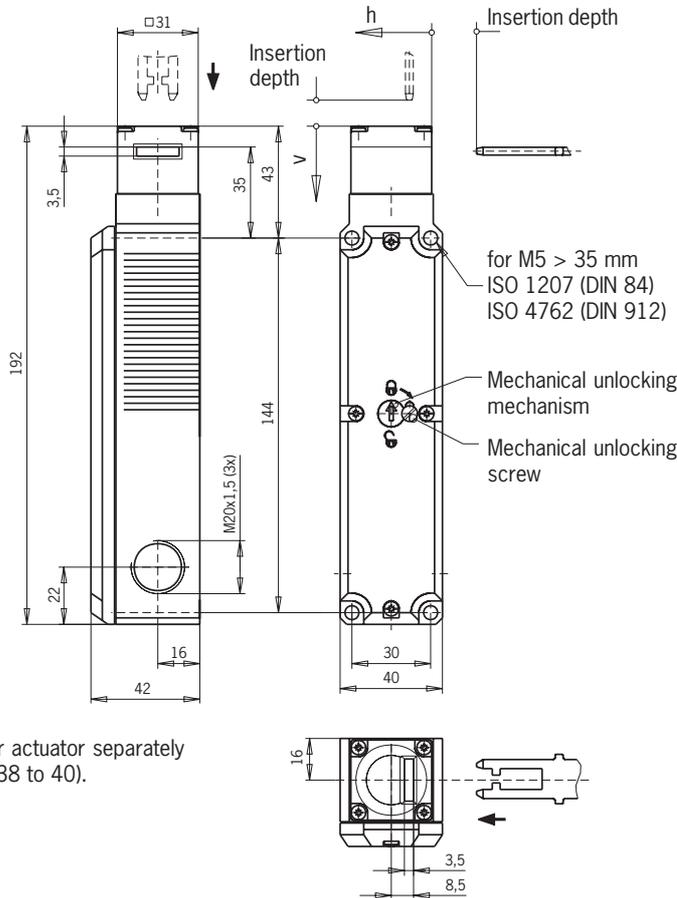
and top **K**, solenoid operating voltage **024** V AC/DC, cable entry **M**  
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Cat. No. 084 253

## Safety switches type series TP...

- ▶ With 4 contact elements
- ▶ With door monitoring contact
- ▶ Cable entry M20x1.5 or Plug connector SR11 (relevant plug connectors see page 47)

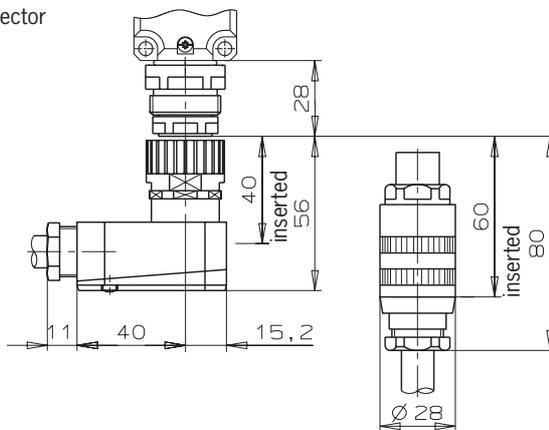
### Dimension drawing type TP...M



Please order actuator separately (see pages 38 to 40).

### Dimension drawing type TP...SR11

Please order plug connector separately (see page 47).



### Installation notes

The safety switch and actuator must be installed properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 43) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

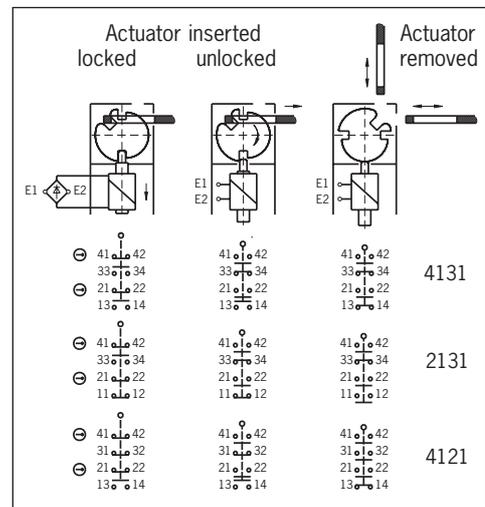


\* with cable entry M, 24 V DC / 110 V AC

### Switching elements

(dependent action contact element)

- 4131** 2 positively driven NC contacts + 1 NO contact + 1 NO contact as door monitoring contact
- 2131** 2 positively driven NC contacts + 1 NO contact + 1 NC contact as door monitoring contact
- 4121** 2 positively driven NC contacts + 1 NC / 1 NO contact as door monitoring contact



### Locking methods

**TP3...**: Actuator inserted, mechanically locked, unlock by applying voltage.

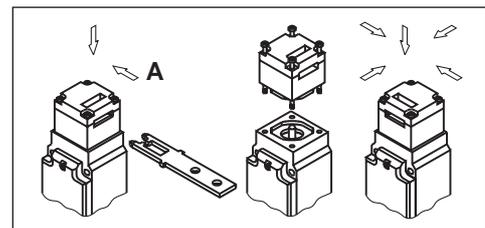
**TP4...**: Lock by applying voltage.

### Mechanical unlocking mechanism

Safety switches can be unlocked by means of the mechanical unlocking mechanism in the event of power failure, for example. The mechanical unlocking mechanism has to be sealed to prevent tampering (for example with sealing lacquer).

### Changing the approach direction

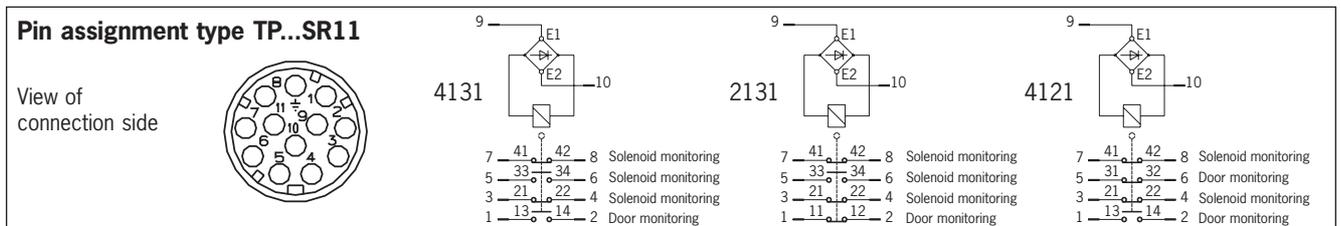
Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction A.



⚠ The complete safety switch must be replaced in the event of faults.

## Technical data

Parameters	Value			Unit
Housing material	Glass fiber reinforced thermoplastic			
Degree of protection to IEC 60529	TP...M: IP 67 / TP...SR11: IP 65			
Mounting position	optional			
Mechanical service life	1 x 10 <sup>6</sup> switching cycles			
Ambient temperature	- 20 to + 55			°C
Approach speed, max.	20			m/min
Insertion/extraction force (not locked)	TP3: approx. 10 / TP4: approx. 15			N
Retention force when locked	1200			N
Weight	approx. 0.5			kg
Switching element	4131	2131	4121	
Contact elements	2NC ⊕ + 1NO + 1NO	2NC ⊖ + 1NO + 1NC	2NC ⊕ + 1NC + 1NO	
Switching principle	Dependent action contact element			
Contact material	silver alloy, gold flashed			
Rated impulse withstand voltage U <sub>imp</sub>	TP...M: U <sub>imp</sub> = 2.5 / TP...SR11: U <sub>imp</sub> = 1.5			kV
Rated insulation voltage U <sub>i</sub>	TP...M: U <sub>i</sub> = 250 / TP...SR11: U <sub>i</sub> = 50			V <sub>≅</sub>
Utilization category to IEC 947-5-1	TP...M: AC-15 I <sub>e</sub> 6 A U <sub>e</sub> 230 V / DC-13 I <sub>e</sub> 6 A U <sub>e</sub> 24 V TP...SR11: 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			
Switching voltage min. at 10 mA	12			V
Switching current min. at 24 V	10			mA
Conventional thermal current I <sub>th</sub>	TP...M: 6 / TP...SR11: 4			A
Short circuit protection (control circuit fuse)	to IEC 60269-1, TP ...M: 6 A gG / TP...SR11: 4 A gG			
Connection method type TP...M	Screw terminal, M20x1.5			
Connection method type TP...SR11	Plug connector SR11			
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm <sup>2</sup>			mm <sup>2</sup>
<b>Solenoid</b>				
Connection	reverse polarity protected, integrated bridge rectifier			
Solenoid operating voltage	24 V AC/DC, 110 V AC, 230 V AC (all -15% / +10%)			
Duty cycle	100			%
Power consumption	8			W
<b>Insertion depth</b> (necessary minimum travel + permissible overtravel)	Standard actuator		Overtravel actuator	
Approach direction side (h)	28 + 2		28 + 7	
Approach direction from top (v)	29.5 + 1.5		-	



## Ordering table

Type series / Version / Locking method / Connection type	Switching element	Increased over- travel	Type designation	Cat. No.		
				Solenoid operating voltage		
				024	110	230
<b>TP3...M</b> Mechanical locking, Cable entry	<b>4131</b>	<b>A</b> (side)	TP3-4131A...M	084 129	084 130	084 131
	<b>2131</b>		TP3-2131A...M	084 142	084 143	084 144
	<b>4121</b>		TP3-4121A...M	084 135	084 137	084 138
<b>TP4...M</b> Electrical locking, Cable entry	<b>4131</b>		TP4-4131A...M	084 132	084 133	084 134
	<b>2131</b>		TP4-2131A...M	084 145	084 147	084 148
	<b>4121</b>		TP4-4121A...M	084 139	084 140	084 141
<b>TP3...SR11</b> Mechanical locking, Plug connector SR11	<b>4131</b>	<b>A</b> (side)	TP3-4131A...SR11	088 204	-	-
	<b>2131</b>		TP3-2131A...SR11	088 205	-	-
	<b>4121</b>		TP3-4121A...SR11	088 206	-	-
<b>TP4...SR11</b> Electrical locking, Plug connector SR11	<b>4131</b>		TP4-4131A...SR11	088 207	-	-
	<b>2131</b>		TP4-2131A...SR11	088 208	-	-
	<b>4121</b>		TP4-4121A...SR11	088 209	-	-

**Ordering example:** TP4, electr. locking, switching element **4131**, increased overtravel side **A**,

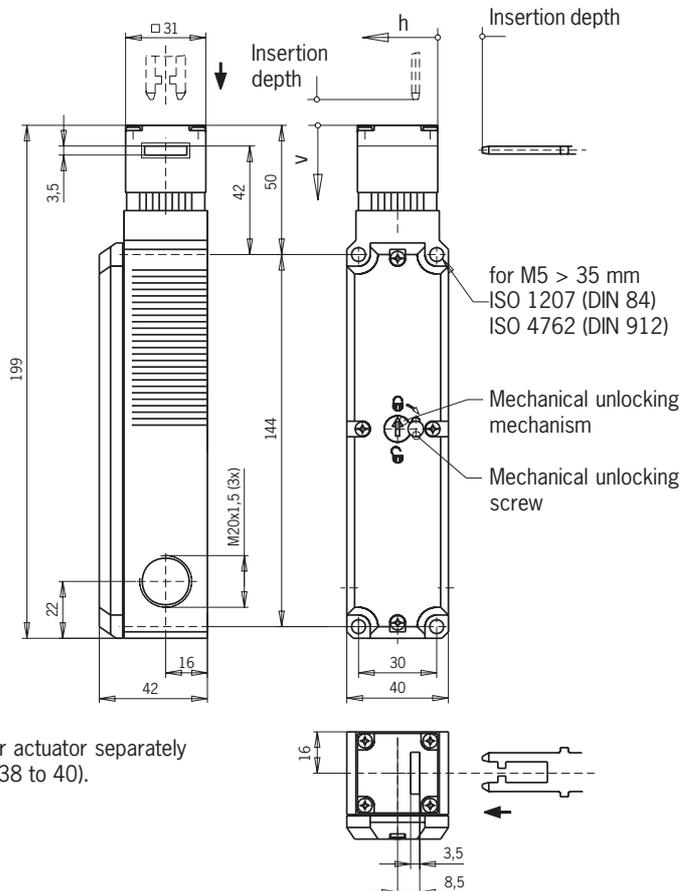
solenoïd operating voltage **024 V AC/DC**, cable entry **M**  
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Cat. No. 084 132

## Safety switches type series TP..K..

- ▶ Increased overtravel with approach direction from top
- ▶ With 4 contact elements, with door monitoring contact
- ▶ Cable entry M20x1.5 or Plug connector SR11 (relevant plug connectors see page 47)

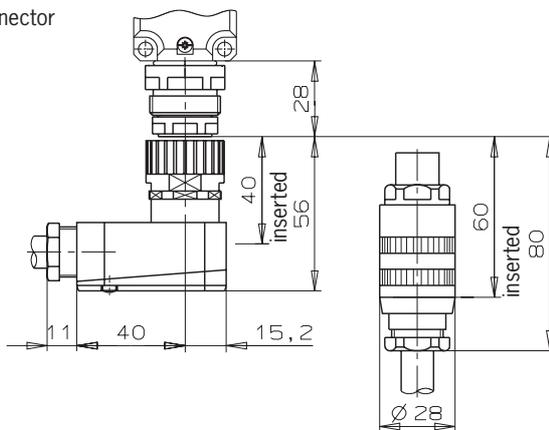
### Dimension drawing type TP...M



Please order actuator separately (see pages 38 to 40).

### Dimension drawing type TP...SR11

Please order plug connector separately (see page 47).



### Installation notes

The safety switch and actuator must be installed properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 43) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

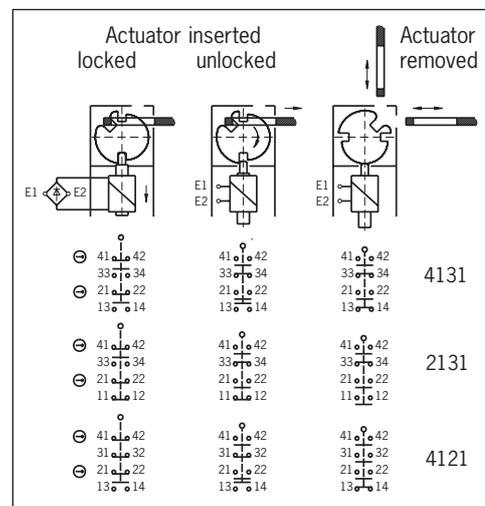


\* with cable entry M, 24 V DC / 110 V AC

### Switching elements

(dependent action contact element)

- 4131** 2 positively driven NC contacts + 1 NO contact + 1 NO contact as door monitoring contact
- 2131** 2 positively driven NC contacts + 1 NO contact + 1 NC contact as door monitoring contact
- 4121** 2 positively driven NC contacts + 1 NC / 1 NO contact as door monitoring contact



### Locking methods

**TP3...**: Actuator inserted, mechanically locked, unlock by applying voltage.

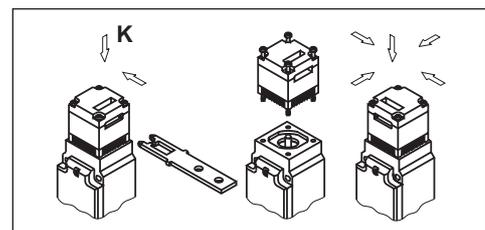
**TP4...**: Lock by applying voltage.

### Mechanical unlocking mechanism

Safety switches can be unlocked by means of the mechanical unlocking mechanism in the event of power failure, for example. The mechanical unlocking mechanism has to be sealed to prevent tampering (for example with sealing lacquer).

### Changing the approach direction

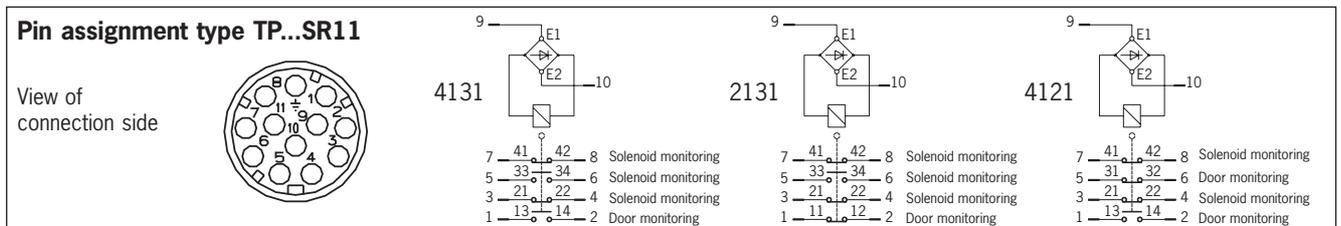
Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction K.



⚠ The complete safety switch must be replaced in the event of faults.

## Technical data

Parameters	Value			Unit
Housing material	Glass fiber reinforced thermoplastic			
Degree of protection to IEC 60529	TP...M: IP 67 / TP...SR11: IP 65			
Mounting position	optional			
Mechanical service life	1 x 10 <sup>6</sup> switching cycles			
Ambient temperature	- 20 to + 55			°C
Approach speed, max.	20			m/min
Insertion/extraction force (not locked)	TP3: approx. 10 / TP4: approx. 15			N
Retention force when locked	1200			N
Weight	approx. 0.5			kg
Switching element	4131	2131	4121	
Contact elements	2NC ⊖ + 1NO + 1NO	2NC ⊖ + 1NO + 1NC	2NC ⊖ + 1NC + 1NO	
Switching principle	Dependent action contact element			
Contact material	silver alloy, gold flashed			
Rated impulse withstand voltage U <sub>imp</sub>	TP...M: U <sub>imp</sub> = 2.5 / TP...SR11: U <sub>imp</sub> = 1.5			kV
Rated insulation voltage U <sub>i</sub>	TP...M: U <sub>i</sub> = 250 / TP...SR11: U <sub>i</sub> = 50			V <sub>≅</sub>
Utilization category to IEC 947-5-1	TP...M: AC-15 I <sub>e</sub> 6 A U <sub>e</sub> 230 V / DC-13 I <sub>e</sub> 6 A U <sub>e</sub> 24 V TP...SR11: 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			
Switching voltage min. at 10 mA	12			V
Switching current min. at 24 V	10			mA
Conventional thermal current I <sub>th</sub>	TP...M: 6 / TP...SR11: 4			A
Short circuit protection (control circuit fuse)	to IEC 60269-1, TP ...M: 6 A gG / TP...SR11: 4 A gG			
Connection method type TP...M	Screw terminal, M20x1.5			
Connection method type TP...SR11	Plug connector SR11			
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm <sup>2</sup>			mm <sup>2</sup>
<b>Solenoid</b>				
Connection	reverse polarity protected, integrated bridge rectifier			
Solenoid operating voltage	24 V AC/DC, 110 V AC, 230 V AC (all -15% / +10%)			
Duty cycle	100			%
Power consumption	8			W
<b>Insertion depth</b> (necessary minimum travel + permissible overtravel)	Standard actuator		Overtravel actuator	
Approach direction side (h)	28 + 2		28 + 7	
Approach direction from top (v)	29.5 + 1.5		29.5 + 7	



## Ordering table

Type series / Version / Locking method / Connection type	Switching element	Increased over- travel	Type designation	Cat. No.		
				Solenoid operating voltage		
				024	110	230
<b>TP3-...M</b> Mechanical locking, Cable entry	<b>4131</b>	<b>K</b> (side + top)	TP3-4131K...M	084 256	084 257	084 258
	<b>2131</b>		TP3-2131K...M	084 264		084 265
	<b>4121</b>		TP3-4121K...M	084 260		084 262
<b>TP4-...M</b> Electrical locking, Cable entry	<b>4131</b>	<b>K</b> (side + top)	TP4-4131K...M	084 259	on request	on request
	<b>2131</b>		TP4-2131K...M	084 266		
	<b>4121</b>		TP4-4121K...M	084 263		
<b>TP3-...SR11</b> Mechanical locking, Plug connector SR11	<b>4131</b>	<b>K</b> (side + top)	TP3-4131K...SR11	088 219	-	-
	<b>2131</b>		TP3-2131K...SR11	088 220		
	<b>4121</b>		TP3-4121K...SR11	088 221		
<b>TP4-...SR11</b> Electrical locking, Plug connector SR11	<b>4131</b>	<b>K</b> (side + top)	TP4-4131K...SR11	088 222	-	-
	<b>2131</b>		TP4-2131K...SR11	088 223		
	<b>4121</b>		TP4-4121K...SR11	088 224		

**Ordering example:** TP4, electr. locking, switching element **4131**, increased overtravel side and

top **K**, solenoid operating voltage **024** V AC/DC, cable entry **M**

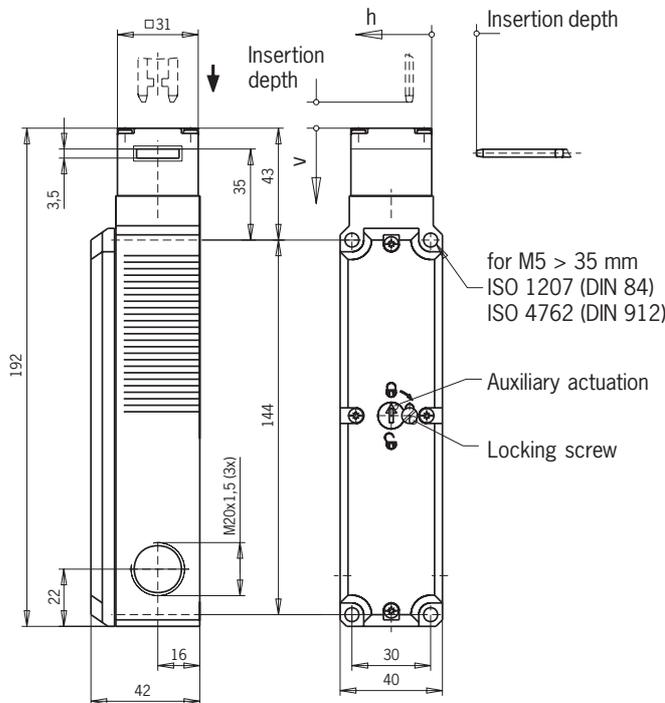
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Cat. No. 084 259

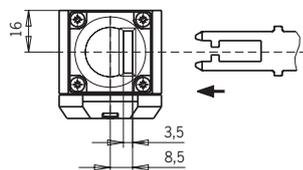
## Safety switches type series TP...

- ▶ With door unlock request contact
- ▶ With 3 contact elements
- ▶ Cable entry M20x1.5 or Plug connector SR11 (relevant plug connectors see page 47)

### Dimension drawing type TP...M

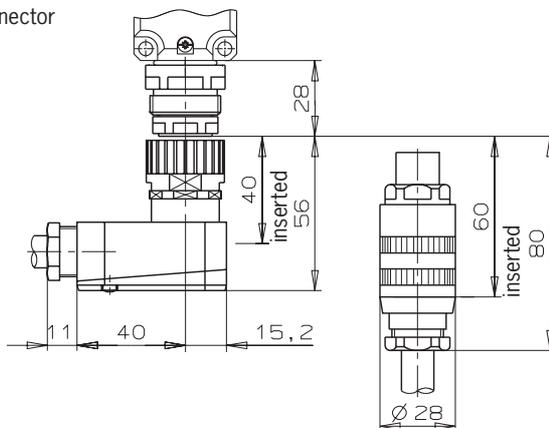


Please order actuator separately (see pages 38 to 40).



### Dimension drawing type TP...SR11

Please order plug connector separately (see page 47).



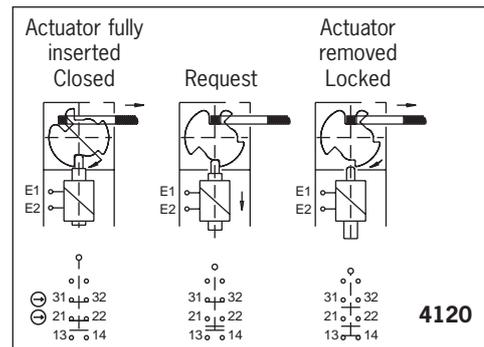
### Installation notes

The safety switch and actuator must be installed properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 43) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

### Switching elements

(dependent action contact element)

- 4120** 1 positively driven NC contact as door unlock request contact  
 1 positively driven NC contact + 1 NO contact  
 (no door monitoring contact)



### Locking methods

**TP5...** Actuator inserted, mechanically locked, unlock by applying voltage.

**TP6...** Lock by applying voltage.

### Door unlock request contact

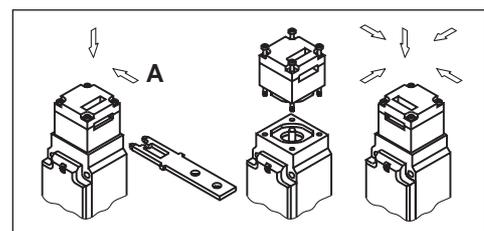
The unlock request contact 21-22 is operated if the door together with the actuator is moved slightly away from its closed position. This action opens the 21-22 contact, which can then be used via the PLC to unlock the solenoid. The door can then be opened in the normal way. This procedure ensures that the control concepts such as run down and safe speed monitoring can still be adhered to.

### Auxiliary actuation

Used to manually operate the switch element. The 21-22 positively driven contact can be opened but the safety guard remains locked.

### Changing the approach direction

Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction A.



⚠ The complete safety switch must be replaced in the event of faults.

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## Technical data

Parameter	Value	Unit	
Housing material	Glass fiber reinforced thermoplastic		
Degree of protection to IEC 60529	TP...M: IP 67 / TP...SR11: IP 65		
Mounting position	optional		
Mechanical service life	5 x 10 <sup>6</sup> switching cycles		
Ambient temperature	- 20 to + 55	°C	
Approach speed, max.	20	m/min	
Insertion/extraction force (not locked)	approx. 8	N	
Retention force when locked	800	N	
Weight	approx. 0.5	kg	
Switching element	4120		
Contact elements	1 NC ⊖ + 1 NC ⊖ + 1 NO		
Switching principle	Dependent action contact element		
Contact material	silver alloy, gold flashed		
Rated impulse withstand voltage U <sub>imp</sub>	TP...M: U <sub>imp</sub> = 2.5 / TP...SR11: U <sub>imp</sub> = 1.5	kV	
Rated insulation voltage U <sub>i</sub>	TP...M: U <sub>i</sub> = 250 / TP...SR11: U <sub>i</sub> = 50	V <sub>≅</sub>	
Utilization category to IEC 947-5-1	TP...M: AC-15 I <sub>e</sub> 6 A U <sub>e</sub> 230 V / DC-13 I <sub>e</sub> 6 A U <sub>e</sub> 24 V TP...SR11: 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		
Switching voltage min. at 10 mA	12	V	
Switching current min. at 24 V	10	mA	
Conventional thermal current I <sub>th</sub>	TP...M: 6 / TP...SR11: 4	A	
Short circuit protection (control circuit fuse)	to IEC 60269-1, TP ...M: 6 A gG / TP...SR11: 4 A gG		
Connection method type TP...M	Screw terminal, M20x1.5		
Connection method type TP...SR11	Plug connector SR11		
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm <sup>2</sup>	mm <sup>2</sup>	
<b>Solenoid</b>			
Connection	reverse polarity protected, integrated bridge rectifier		
Solenoid operating voltage	24 V AC/DC, 110 V AC, 230 V AC (all -15% / +10%)		
Duty cycle	100	%	
Power consumption	8	W	
<b>Insertion depth</b> (necessary minimum travel + permissible overtravel)	Standard actuator	Overtravel actuator	
Approach direction side (h)	28 + 2	28 + 7	mm
Approach direction from top (v)	29.5 + 1.5	-	mm

**Pin assignment type TP...SR11**

View of connection side

4120

5 — 31 — 32 — 6 Solenoid monitoring  
3 — 21 — 22 — 4 Door unlock request contact  
1 — 13 — 14 — 2 Solenoid monitoring

## Ordering table

Type series / Version / Locking method / Connection type	Switching element	Increased over-travel	Type designation	Cat. No.		
				Solenoid operating voltage		
				024	110	230
<b>TP5...M</b> Mechanical locking, Cable entry	4120	A (side)	TP5-4120A...M	084 279	on request	on request
<b>TP6...M</b> Electrical locking, Cable entry			TP6-4120A...M	084 280		
<b>TP5...SR11</b> Mechanical locking, Plug connector SR11	4120	A (side)	TP5-4120A...SR11	on request	on request	on request
<b>TP6...SR11</b> Electrical locking, Plug connector SR11			TP6-4120A...SR11			

**Ordering example:** TP6, electr. locking, switching element 4120, increased overtravel side A,

solenoid operating voltage 024 V AC/DC, cable entry M
   
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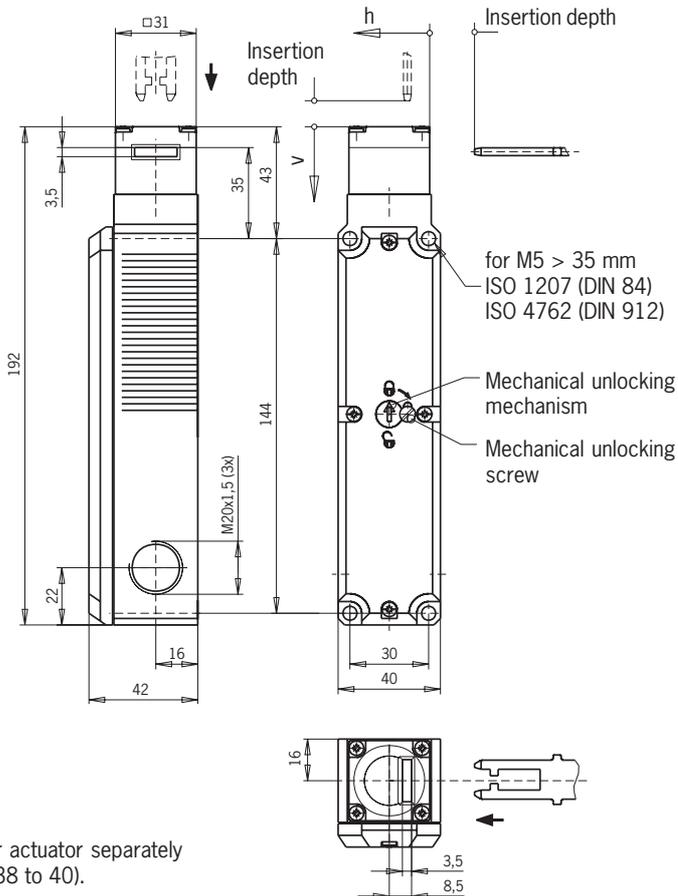
## Safety switches type series TP...

- ▶ With 4 positively driven NC contacts
- ▶ With door monitoring contact
- ▶ Cable entry M20x1.5



\* Approvals pending

## Dimension drawing type TP...M



Please order actuator separately (see pages 38 to 40).

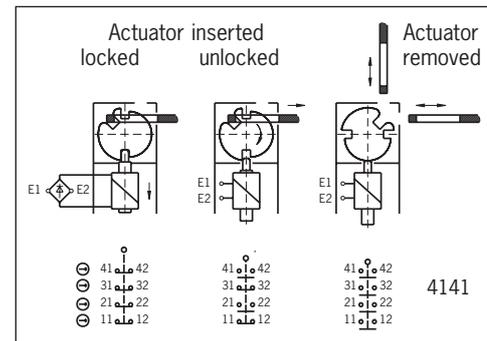
## Technical data

As for standard version (see pages 14 - 26).

## Switching elements

(dependent action contact element)

- 4141** 2 positively driven NC contacts (solenoid monitoring), 2 positively driven NC contacts (door monitoring)



## Locking methods

**TP3...**: Actuator inserted, mechanically locked, unlock by applying voltage.

**TP4...**: Lock by applying voltage.

## Mechanical unlocking mechanism

Safety switches can be unlocked by means of the mechanical unlocking mechanism in the event of power failure, for example. The mechanical unlocking mechanism has to be sealed to prevent tampering (for example with sealing lacquer).

## Ordering table (further types available on request)

Type series / Version / Locking method / Connection type	Switching element	Increased over-travel	Type designation	Cat. No.
				Solenoid operating voltage 024
TP3-...M Mechanical locking, Cable entry	4141	A (side)	TP3-4141A024M	084 270
TP4-...M Electrical locking, Cable entry			TP4-4141A024M	084 275

Ordering example: TP3, Mech. locking, switching element 4141, increased overtravel side A, solenoid operating voltage 024 V AC/DC, cable entry M

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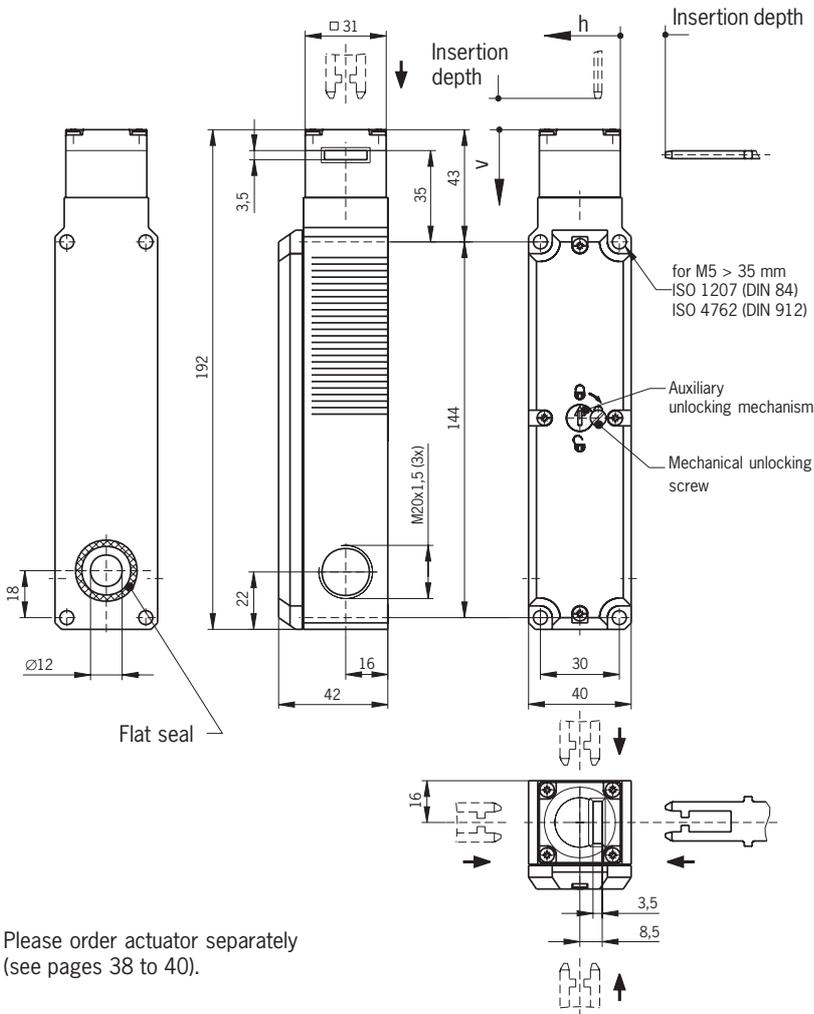
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Cat. No. 084 270

## Safety switches type series TP...

- ▶ With additional cable entry through the rear mounting face
- ▶ With 4 contact elements, with door monitoring contact
- ▶ Cable entry M20x1.5

### Dimension drawing type TP...M C1761



### Technical data

As for standard version (see pages 14 - 26)

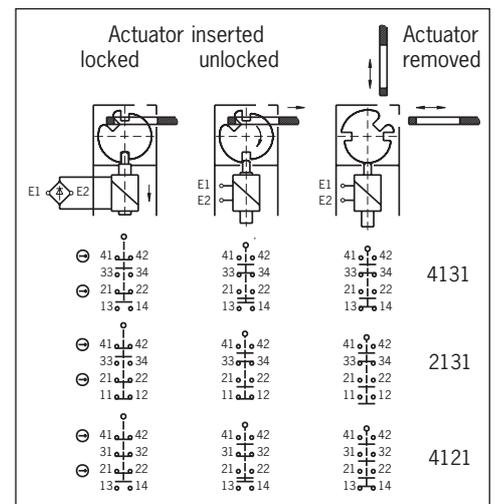
### Deviation from standard

- ▶ Opening in the rear of housing for a cable gland. A flat seal between the rear housing and the mounting face prevents the ingress of dirt.

### Switching elements

(dependent action contact element)

- 4131** 2 positively driven NC contacts + 1 NO contact + 1 NO contact as door monitoring contact
- 2131** 2 positively driven NC contacts + 1 NO contact + 1 NC contact as door monitoring contact
- 4121** 2 positively driven NC contacts + 1 NC contact / 1 NO contact as door monitoring contact



### Locking methods

**TP3...:** Actuator inserted, mechanically locked, unlock by applying voltage.

**TP4...:** Lock by applying voltage.

### Ordering table (further types available on request)

Type series / Version / Locking method / Connection type	Switching element	Increased over-travel	Type designation	Cat. No.	
				Solenoid operating voltage 024	
TP3-...M Mechanical locking, Cable entry	<b>2131</b>	<b>A</b> (side)	TP3-2131A024M C1761	084 290	

**Ordering example:** TP3, Mech. locking, switching element **2131**, increased overtravel side **A**, solenoid operating voltage **024 V AC/DC**, cable entry **M**

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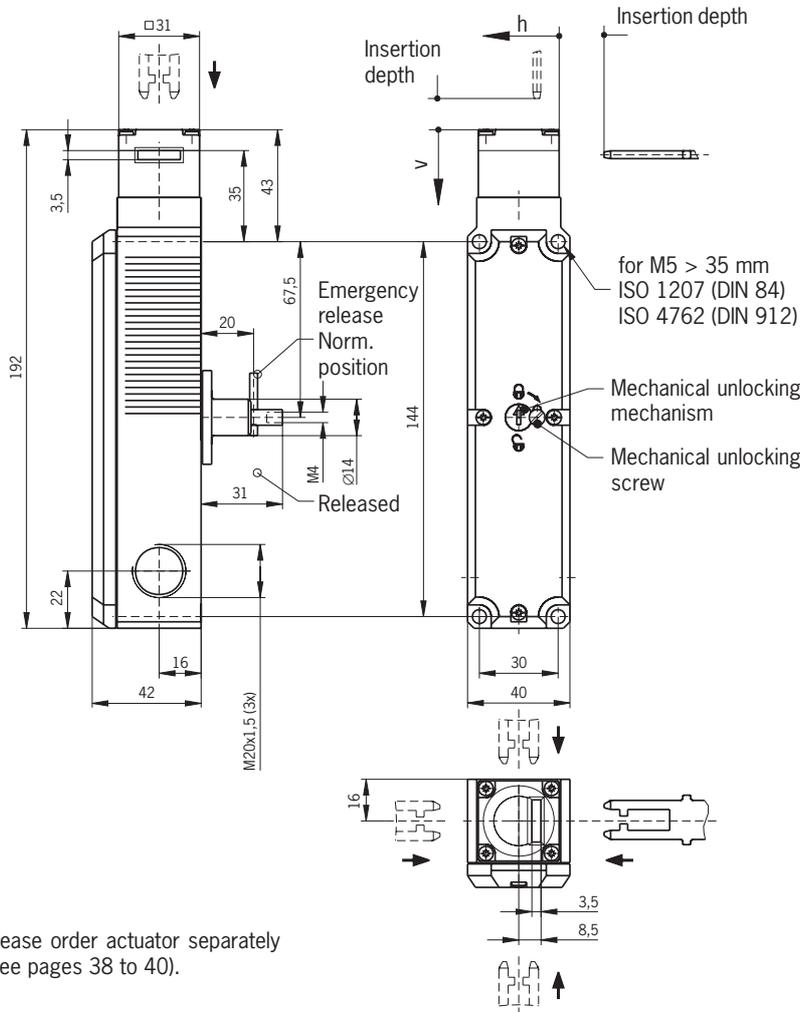
Cat. No. 084 290

## Safety switches type series TP...



- ▶ Emergency release through the rear mounting face
- ▶ Short actuation axis
- ▶ With 4 contact elements, with door monitoring contact
- ▶ Cable entry M20x1.5

### Dimension drawing type TP...M C1743



Please order actuator separately (see pages 38 to 40).

### Technical data

As for standard version (see pages 14 - 26)

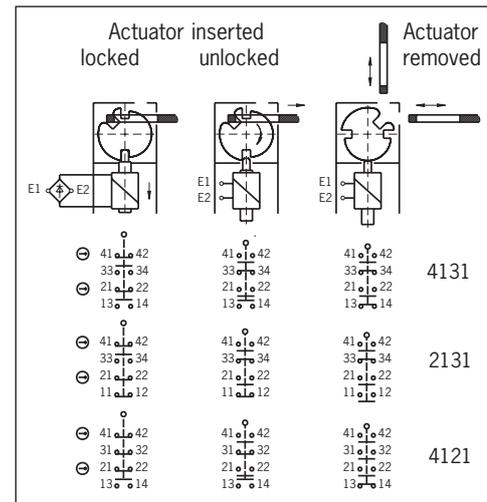
### Deviation from standard

- ▶ Emergency release through the rear mounting face with marked ON/OFF position

### Switching elements

(dependent action contact element)

- 4131** 2 positively driven NC contacts + 1 NO contact + 1 NO contact as door monitoring contact
- 2131** 2 positively driven NC contacts + 1 NO contact + 1 NC contact as door monitoring contact
- 4121** 2 positively driven NC contacts + 1 NC contact / 1 NO contact as door monitoring contact



### Locking methods

- TP3...**: Actuator inserted, mechanically locked, unlock by applying voltage.
- TP4...**: Lock by applying voltage.

### Ordering table (further types available on request)

Type series / Version / Locking method / Connection type	Switching element	Increased over-travel	Type designation	Cat. No.
				Solenoid operating voltage
TP3...M Mechanical locking, Cable entry	2131	A (side)	TP3-2131A024M C1743	084 285
	4121		TP3-4121A024M C1743	087 427

**Ordering example:** TP3, Mech. locking, switching element 2131, increased overtravel side A, solenoid operating voltage 024 V AC/DC, cable entry M

Type TP3-2131 A 024 M C1743

Cat. no. 084 285

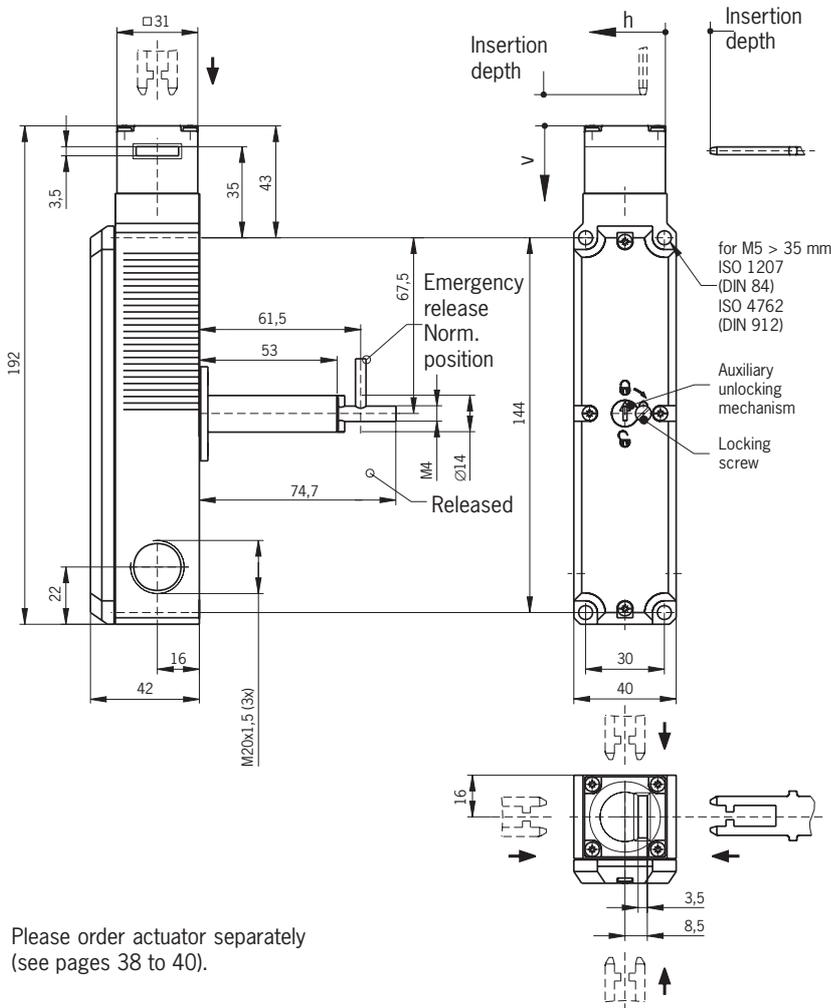
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## Safety switches type series TP...

- ▶ Emergency release through the rear mounting face
- ▶ Long actuation axis
- ▶ With 4 contact elements, with door monitoring contact
- ▶ Cable entry M20 x 1.5

### Dimension drawing type TP...M C1993



Please order actuator separately (see pages 38 to 40).

### Technical data

As for standard version (see pages 14 - 26)

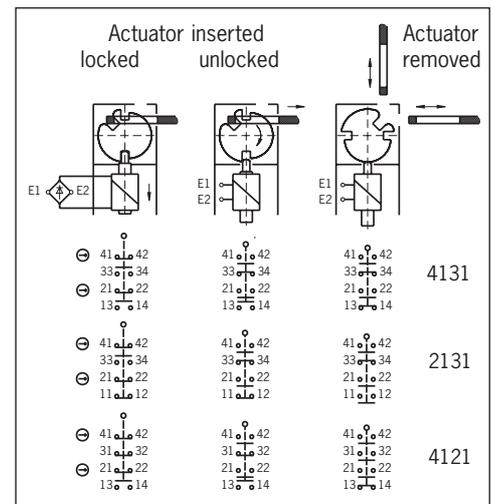
### Deviation from standard

- ▶ The switch with a long actuation axis is suitable for fixing directly to 40 mm wide aluminum profiles. It can be used in combination with bolt TP-F (see page 50).

### Switching elements

(dependent action contact element)

- 4131** 2 positively driven NC contacts + 1 NO contact + 1 NO contact as door monitoring contact
- 2131** 2 positively driven NC contacts + 1 NO contact + 1 NC contact as door monitoring contact
- 4121** 2 positively driven NC contacts + 1 NC contact / 1 NO contact as door monitoring contact



### Locking methods

**TP3...:** Actuator inserted, mechanically locked, unlock by applying voltage.

**TP4...:** Lock by applying voltage.

### Ordering table (further types available on request)

Type series / Version / Locking method / Connection type	Switching element	Increased over-travel	Type designation	Cat. No.	
				Solenoid operating voltage	
				024	
<b>TP3...M</b> Mechanical locking, Cable entry	<b>2131</b>	<b>A</b> (side)	TP3-2131A024M C1993	087 400	

**Ordering example:** TP3, Mech. locking, switching element 2131, increased overtravel side A, solenoid operating voltage 024 V AC/DC, cable entry M

Type TP3-2131 A 024 M C1761

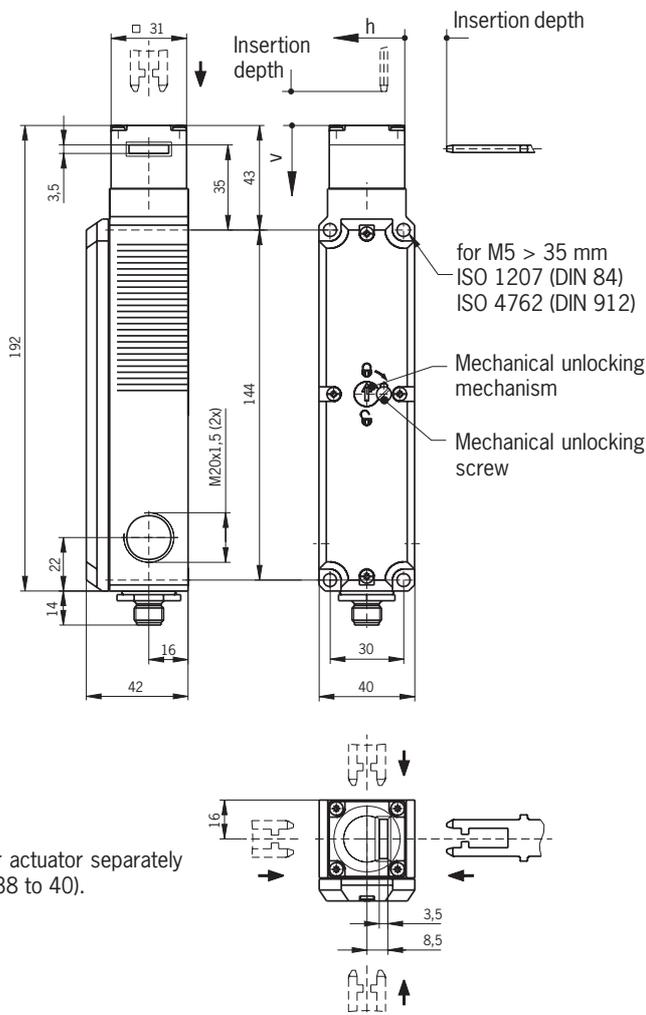
Cat no. 087 400

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## Safety switches type series TP...

- ▶ **With 3 positively driven NC contacts**  
(fed out through M12 plug connector)
- ▶ **With door monitoring contact**
- ▶ **M12 plug connector** (relevant plug connectors see page 46)

### Dimension drawing type TP...M C1992



Please order actuator separately (see pages 38 to 40).

### Installation notes

The safety switch and actuator must be assembled properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 43) or by welding, riveting, pinning. The safety switch must not be used as an end stop.



\* Approvals pending

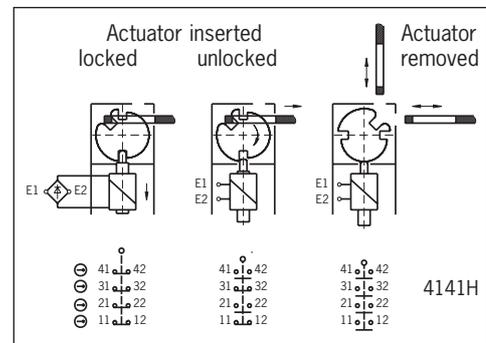
### Deviation from standard

- ▶ An M12 8-pole plug connector is used for connection to safety switch TP...C1992. This switch version is suitable for direct connection to a safe bus module.

### Switching elements

(dependent action contact element)

- 4141H** 2 positively driven NC contacts (sole-noid monitoring), 2 positively driven NC contacts (door monitoring)



### Locking methods

**TP3...:** Actuator inserted, mechanically locked, unlock by applying voltage.

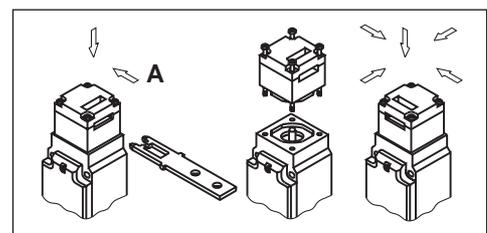
**TP4...:** Lock by applying voltage.

### Mechanical unlocking mechanism

Safety switches can be unlocked by means of the mechanical unlocking mechanism in the event of power failure, for example. The mechanical unlocking mechanism has to be sealed to prevent tampering (for example with sealing lacquer).

### Changing the approach direction

Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction A.



⚠ The complete safety switch must be replaced in the event of faults.

## Technical data

Parameters	Value	Unit	
Housing material	Glass fiber reinforced thermoplastic		
Degree of protection to IEC 60529	IP 67		
Mounting position	optional		
Mechanical service life	1 x 10 <sup>6</sup> switching cycles		
Ambient temperature	- 20 to + 55	°C	
Approach speed, max.	20	m/min	
Insertion/extraction force (not locked)	TP3: approx.10 / TP4: approx. 15	N	
Retention force when locked	1200	N	
Weight	approx. 0.5	kg	
Switching element	4141H		
Contact elements	2 NC ⊖ + 2 NC ⊕		
Switching principle	Dependent action contact element		
Contact material	silver alloy, gold flashed		
Rated impulse withstand voltage U <sub>imp</sub>	1,5	kV	
Rated insulation voltage U <sub>i</sub>	30	V <sub>≅</sub>	
Utilization category to IEC 947-5-1	AC-15 I <sub>e</sub> 1 A U <sub>e</sub> 24 V / DC-13 I <sub>e</sub> 1 A U <sub>e</sub> 24 V		
Switching voltage min. at 10 mA	12	V	
Switching current min. at 24 V	1	mA	
Conventional thermal current I <sub>th</sub>	1	A	
Short circuit protection (control circuit fuse)	to IEC 60269-1: 1 A gG		
Connection type	M12 plug connector		
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm <sup>2</sup>	mm <sup>2</sup>	
<b>Solenoid</b>			
Connection	reverse polarity protected, integrated bridge rectifier		
Solenoid operating voltage	24 V AC/DC (all -15% / +10%)		
Duty cycle	100	%	
Power consumption	8	W	
<b>Insertion depth</b> (necessary minimum travel + permissible overtravel)	Standard actuator	Overtravel actuator	
Approach direction side (h)	28 + 2	28 + 7	mm
Approach direction from top (v)	29.5 + 1.5	-	mm

**Pin assignment type TP...C1992**

View of connection side

4141H

7 — 41 — 42 — 8 Solenoid monitoring  
31 — 32 —  
3 — 21 — 22 — 4 Solenoid monitoring  
1 — 11 — 12 — 2 Door monitoring

## Ordering table (further types available on request)

Type series / Version / Locking method / Connection type	Switching element	Increased over-travel	Type designation	Cat. No.
				Solenoid operating voltage 024
<b>TP3-...M</b> Mechanical locking, M12 plug connector	<b>4141H</b>	<b>A</b> (side)	TP3-4141HA024SM8 C1992	087 377
<b>TP4-...M</b> Electrical locking, M12 plug connector			TP4-4141HA024SM8 C1992	087 378

**Ordering example:** TP3, Mech. locking, switching element **4141H**, increased overtravel side **A**, solenoid operating voltage **024** V AC/DC, M12 plug connector  
**Type TP3-4141H A 024 SM8 C1992**

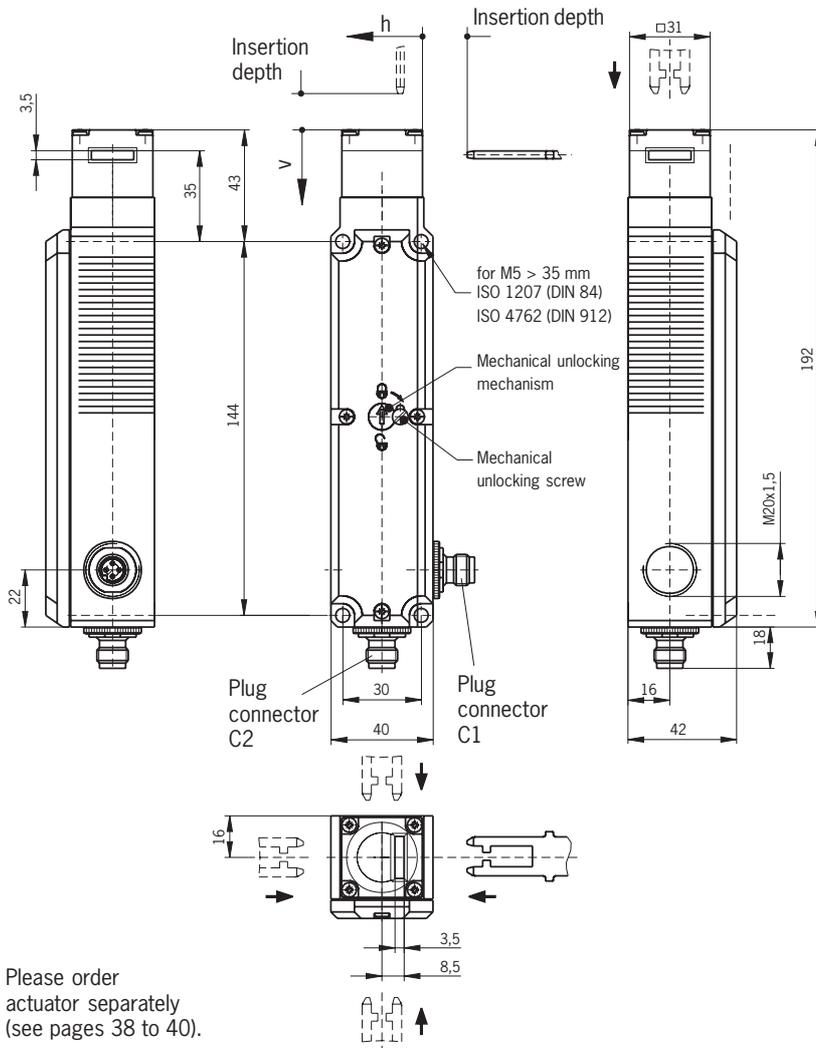
**Cat. No. 087 377**

## Safety switches type series TP...

- ▶ **With 2 positively driven NC contacts**  
(fed out through C2 plug connector)
- ▶ **With door monitoring contact**
- ▶ **2 M12 plug connectors** (4-pole)

### Dimension drawing type TP...M C2013

(M12 plug connector right)



Please order actuator separately (see pages 38 to 40).

### Plug connector alignment

Plug connector C2 is aligned so that the cable exits downwards in the case of an angled M12 plug connector. Plug connector C1 is not aligned.

### Installation notes

The safety switch and actuator must be assembled properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 43) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

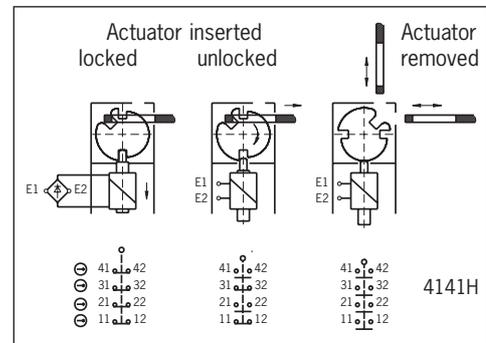
### Deviation from standard

- ▶ Two M12 4-pole plug connectors are used for connection to safety switches TP...C2012 and TP...C2013. This switch version is suitable for direct connection to a safe bus module for example.

### Switching elements

(dependent action contact element)

- 4141H** 2 positively driven NC contacts (solenoid monitoring), 2 positively driven NC contacts (door monitoring)



### Locking methods

**TP3...**: Actuator inserted, mechanically locked, unlock by applying voltage.

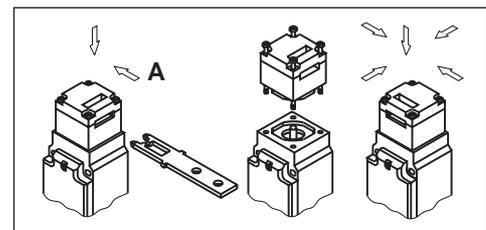
**TP4...**: Lock by applying voltage.

### Mechanical unlocking mechanism

Safety switches can be unlocked by means of the mechanical unlocking mechanism in the event of power failure, for example. The mechanical unlocking mechanism has to be sealed to prevent tampering (for example with sealing lacquer).

### Changing the approach direction

Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction A.



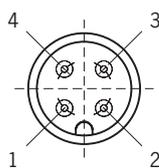
⚠ The complete safety switch must be replaced in the event of faults.

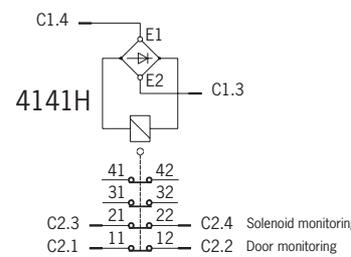
## Technical data

Parameters	Value	Unit	
Housing material	Glass fiber reinforced thermoplastic		
Degree of protection to IEC 60529	IP 67		
Mounting position	optional		
Mechanical service life	1 x 10 <sup>6</sup> switching cycles		
Ambient temperature	- 20 to + 55	°C	
Approach speed, max.	20	m/min	
Insertion/extraction force (not locked)	approx. 10	N	
Retention force when locked	1200	N	
Weight	approx. 0.5	kg	
Switching element	4141H		
Contact elements	2 NC $\ominus$ + 2 NC $\ominus$		
Switching principle	Dependent action contact element		
Contact material	silver alloy, gold flashed		
Rated impulse withstand voltage U <sub>imp</sub>	2.5	kV	
Rated insulation voltage U <sub>i</sub>	250	V <sub>≒</sub>	
Utilization category to IEC 947-5-1	AC-15 I <sub>e</sub> 1.5 A U <sub>e</sub> 230 V / DC-13 I <sub>e</sub> 1.5 A U <sub>e</sub> 24 V		
Switching voltage min. at 10 mA	12	V	
Switching current min. at 24 V	1	mA	
Conventional thermal current I <sub>th</sub>	2	A	
Short circuit protection (control circuit fuse)	to IEC 60269-1: 2 A gG		
connection type	2 M12 plug connectors		
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm <sup>2</sup>	mm <sup>2</sup>	
<b>Solenoid</b>			
Connection	reverse polarity protected, integrated bridge rectifier		
Solenoid operating voltage	24 V AC/DC, 110 V AC, 230 V AC (all -15% / +10%)		
Duty cycle	100	%	
Power consumption	8	W	
<b>Insertion depth</b> (necessary minimum travel + permissible overtravel)	Standard actuator	Overtravel actuator	
Approach direction side (h)	28 + 2	28 + 7	mm
Approach direction from top (v)	29.5 + 1.5	-	mm

**Pin assignment type TP...C2012 / TP...C2013**

View of connection side of plug connector C1 and C2





## Ordering table (further types available on request)

Type series / Version / Locking method / Connection type	Switching element	Increased over-travel	Type designation	Cat. No.
				Solenoid operating voltage <b>024</b>
<b>TP3...C2012</b> Mechanical locking, M12 plug connector left	<b>4141H</b>	<b>A</b> (side)	TP3-4141HA024SM4C2012	087 425
<b>TP3...C2013</b> Mechanical locking, M12 plug connector right			TP3-4141HA024SM4C2013	087 426

**Ordering example:** TP3, Mech. locking, switching element **4141H**, increased overtravel side **A**, solenoid operating voltage **024** V DC, left M12 plug connector  
**Type TP3-4141H A 024 SM4 C2012**

**Cat. No. 087 425**

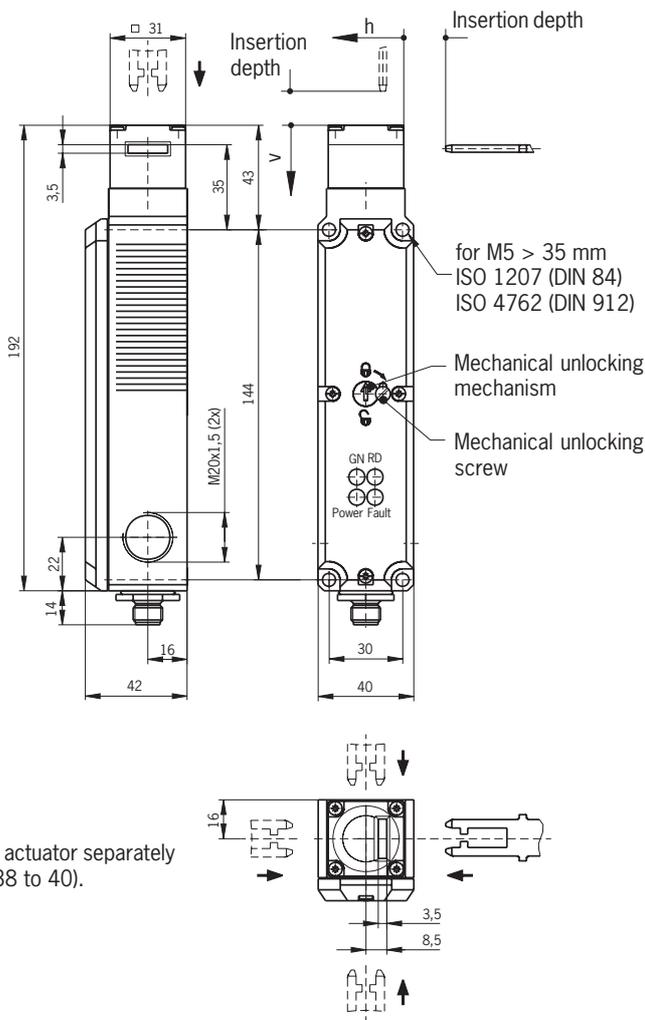
## Safety switches type series TP...



\* Approvals pending

- ▶ **With integrated AS-Interface Safety at Work**
- ▶ **With 2 positively driven NC contacts**  
(via M12 plug connector for AS-Interface Safety at Work)
- ▶ **With door monitoring contact**
- ▶ **With LED display**

### Dimension drawing type TP...SEM4AS1



Please order actuator separately (see pages 38 to 40).

### Monitoring of safe bus users

The safe units on the AS-Interface bus must be monitored by EUCHNER bus monitor SFM-A01 or SFM-A02.

### Installation notes

The safety switch and actuator must be installed properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 43) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

### Control of the interlocking solenoids

The interlocking magnet is controlled by the control system via AS-Interface bus bit D0. Simple connection to the bus is sufficient for process protection. For personal protection, further steps must be taken to ensure a safe work environment.

### AS-Interface Safety at Work

The state of the safety switch door position and the guard-locking are monitored through the bus. The individual signals are obtained and evaluated in the control system. The signals are sent by means of eight 4-bit code sequences on the bus.

### Connection to the AS-Interface Bus

The bus signals and auxiliary voltage are carried on single M12 plug (see sample applications, pages 52 - 54). A passive bus interface is used for the connection.

### Locking methods

**TP3...**: Actuator inserted, mechanically locked, unlock by applying voltage.

**TP4...**: Lock by applying voltage.

### LED function display

LED indicates **Power** supply to the bus.

The **Fault** LED lights up when a fault is detected on the AS-Interface bus.

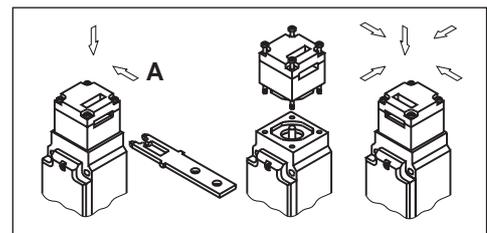
The green and the red LEDs can be optionally controlled with bits D1 and D2 by the control via the bus.

### Mechanical unlocking mechanism

Safety switches can be unlocked by means of the mechanical unlocking mechanism in the event of power failure, for example. The mechanical unlocking mechanism has to be sealed to prevent tampering (for example with sealing lacquer).

### Changing the approach direction

Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction A.



⚠ The complete safety switch must be replaced in the event of faults.

## Technical data

Parameters	Value	Unit
Housing material	Glass fiber reinforced thermoplastic	
Degree of protection to IEC 60529	IP 67	
Mounting position	optional	
Mechanical service life	1 x 10 <sup>6</sup> switching cycles	
Ambient temperature	- 20 to + 55	°C
Approach speed, max.	20	m/min
Insertion/extraction force (not locked)	TP3: approx.10 / TP4: approx. 15	N
Retention force when locked	1200	N
Weight	approx. 0.5	kg
Contact elements	Positively driven NC contacts	
Switching principle	Dependent action contact element	
EMC protection requirements	acc. to EN 50295 (AS-Interface standard) and IEC 62026	
<b>Interlocking solenoid</b>		
Solenoid operating voltage (auxiliary voltage on black AS-Interface line)	24 -15%/+10% A power supply unit with electrical separation (IEC 60742, PELV)	V DC
Solenoid operating current	300	mA
Duty cycle	100	%
connection type	M12 plug connector	
<b>AS-Interface data</b> AS-Interface Specification 2.1	EA code: 7 ID code: B	
Total current consumption, max.	45	mA
Valid AS-Interface addresses	1 - 31	
<b>AS-Interface inputs</b>		
acc. to AS-Interface Safety at Work		
AS-Interface inputs influenced by protective door	D0, D1	
AS-Interface inputs influenced by locking device	D2, D3	
<b>AS-Interface outputs</b>		
D0	Interlocking solenoid, 1 = solenoid energised	
D1	LED red, 1 = LED on	
D2	LED green, 1 = LED on	
AS-Interface LED Power	green, AS-Interface voltage present	
AS-Interface LED Fault	red, offline phase or address 0	
<b>Insertion depth</b> (necessary minimum travel + permissible overtravel)	Standard actuator Overtravel actuator	
Approach direction side (h)	28 + 2 28 + 7	mm
Approach direction from top (v)	29.5 + 1.5 -	mm

**Pin assignment type TP...SEM4AS1**

View of connection side

- 1 ► AS-Interface +
- 2 ► Auxiliary voltage 0 V
- 3 ► AS-Interface -
- 4 ► Auxiliary voltage 24 V

## Ordering table (further types available on request)

Type series / Version / Locking method / Connection type	Switching element	Increased over- travel	Type designation	Cat. No.
				Solenoid operating voltage 024
<b>TP3-...SEM4AS1</b> Mechanical locking, M12 plug connector	<b>4141H</b>	<b>A</b> (side)	TP3-4141HA024SEM4AS1	088 256
<b>TP4-...SEM4AS1</b> Electrical locking, M12 plug connector			TP4-4141HA024SEM4AS1	088 257

**Ordering example:** TP3, Mech. locking, switching element **4141H**, increased overtravel side **A**, Solenoid operating voltage **024** V DC, M12 plug connector  
**Type TP3-4141H A 024 SEM4AS1**

Cat. No. 088 256

[深圳市卡普特机电设备有限公司](http://www.ttcie.com)  
[0755-21513506 Sales@ttcie.com](mailto:Sales@ttcie.com)

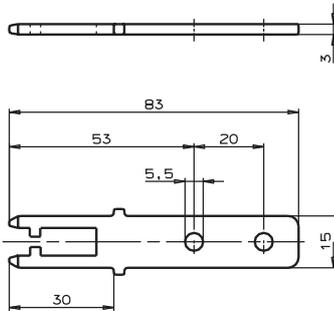
## Accessories

### Standard actuators

#### Straight actuator

(incl. 2 safety screws M5x10)

Type	Cat. No.
Actuator-P-G	059 226

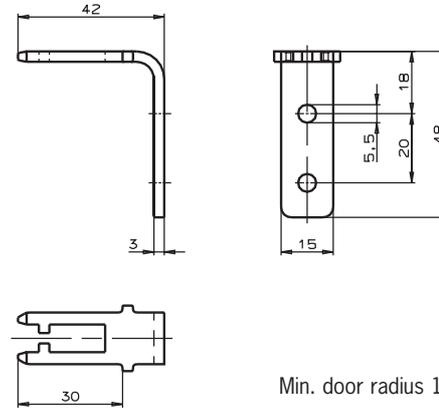


Min. door radius 1000 mm

#### Bent actuator

(incl. 2 safety screws M5x10)

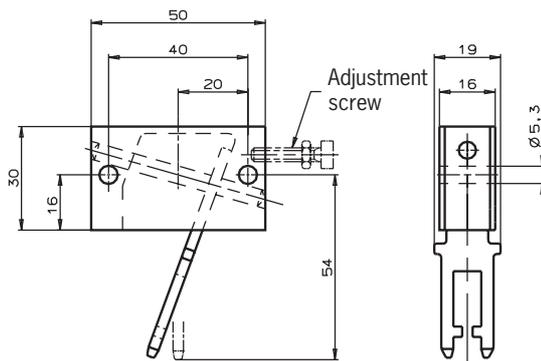
Type	Cat. No.
Actuator-P-W	059 227



Min. door radius 1000 mm

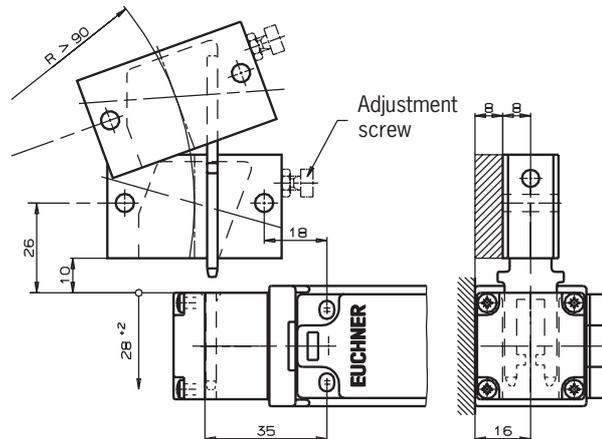
#### Hinged actuator for top and bottom hinged doors

(incl. 2 safety screws M5x25)



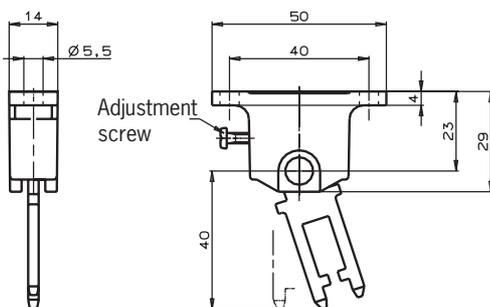
Min. door radius 90 mm

Type	Cat. No.
Hinged actuator P-OU	070 050



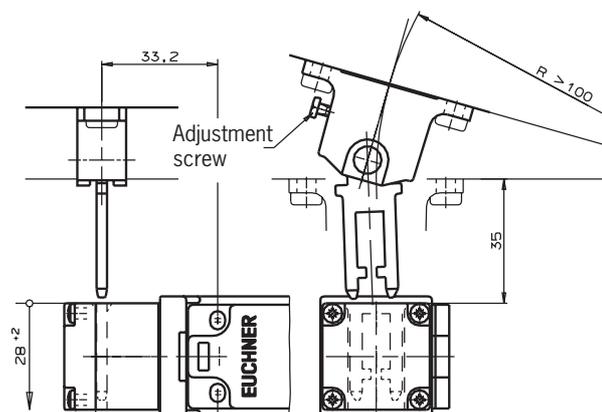
#### Hinged actuator for right and left hinged doors

(incl. 2 safety screws M5x10)



Min. door radius 100 mm

Type	Cat. No.
Hinged actuator P-LR	059 440



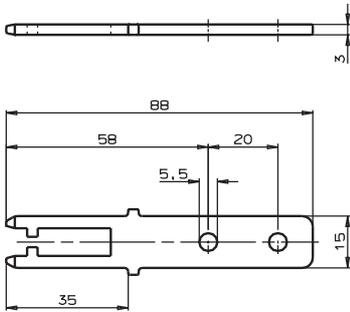
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0755-21513506 Sales@ttcie.com

## Overtravel actuators

### Straight actuator

(incl. 2 safety screws M5x10)

Type	Cat. No.
Actuator-P-GN	074 570

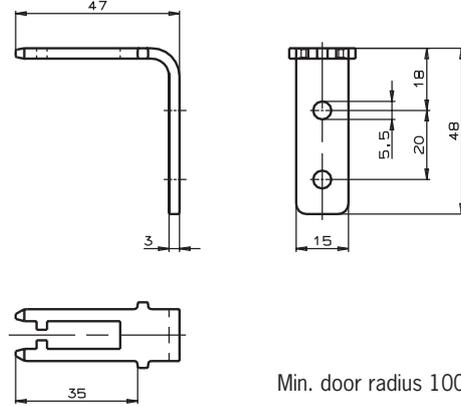


Min. door radius 1000 mm

### Bent actuator

(incl. 2 safety screws M5x10)

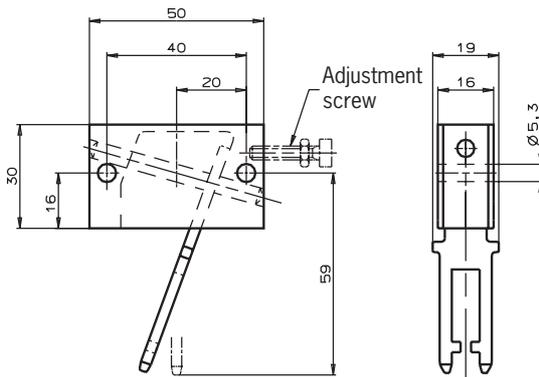
Type	Cat. No.
Actuator-P-WN	074 571



Min. door radius 1000 mm

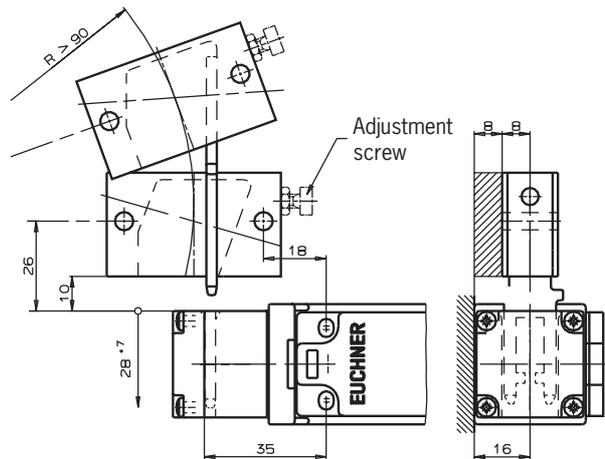
### Hinged actuator for top and bottom hinged doors

(incl. 2 safety screws M5x25)



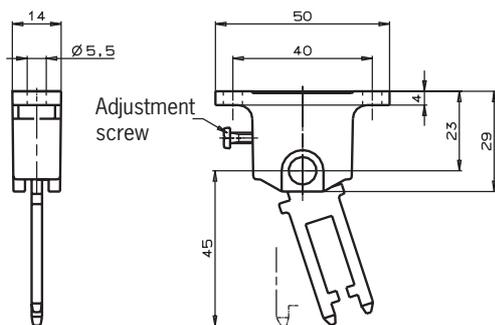
Min. door radius 90 mm

Type	Cat. No.
Hinged actuator P-OUN	074 572



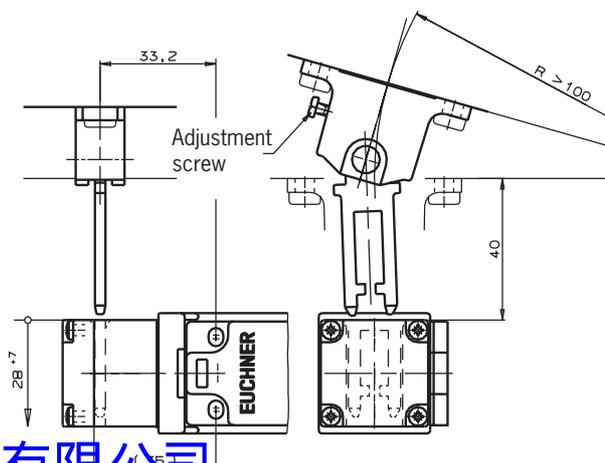
### Hinged actuator for right and left hinged doors

(incl. 2 safety screws M5x10)



Min. door radius 100 mm

Type	Cat. No.
Hinged actuator P-LRN	074 573

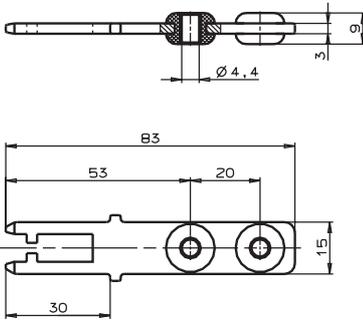


## Standard actuators with rubber bush

### Straight actuator

(incl. 2 safety screws M4x14)

Type	Cat. No.
Actuator-P-GT	070 046

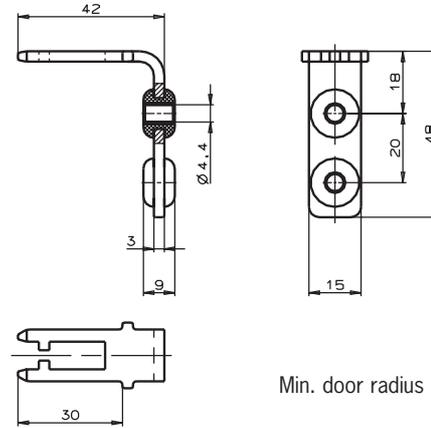


Min. door radius 1000 mm

### Bent actuator

(incl. 2 safety screws M4x14)

Type	Cat. No.
Actuator-P-WT	070 038



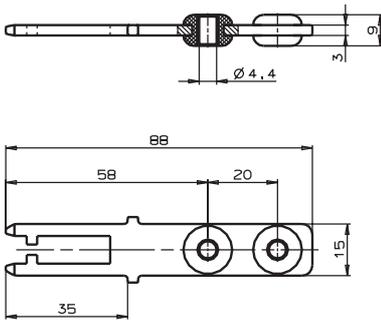
Min. door radius 1000 mm

## Overtravel actuators with rubber bush

### Straight actuator

(incl. 2 safety screws M4x14)

Type	Cat. No.
Actuator-P-GNT	074 576

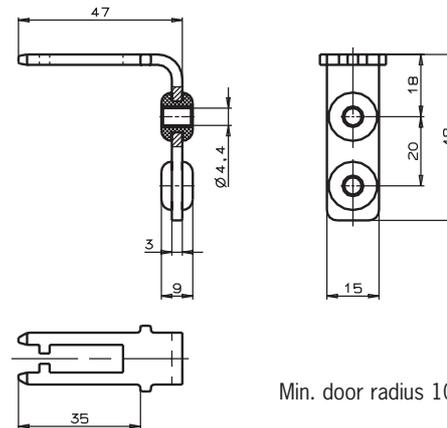


Min. door radius 1000 mm

### Bent actuator

(incl. 2 safety screws M4x14)

Type	Cat. No.
Actuator-P-WNT	074 577

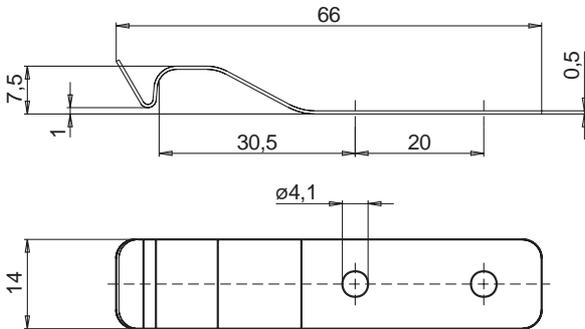


Min. door radius 1000 mm

## Latch spring for increased retention force

(for safety switches NP and/or TP in unlocked condition)

Type	Cat. No.
Latch spring NP/TP	076 501

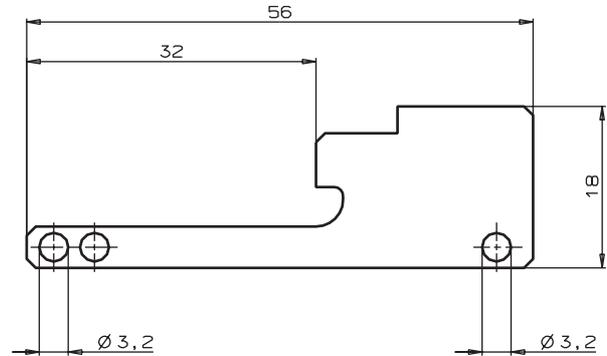


### Notes

- ▶ The latch spring provides an increased retention force of approx. 30 N
- ▶ May only be used in conjunction with the straight actuator with rubber bush (Cat. No. 070 046)

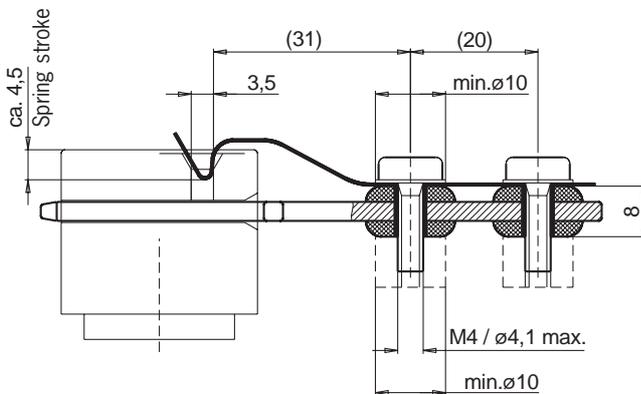
## Lockout bar

Type	Cat. No.
Lockout bar P	070 651



When the safety guard is in the open condition, the lockout bar can be inserted into the safety switch head in-place of the actuator. The lockout bar can be secured with 2 standard commercially available padlocks providing a secure lockout method of a potentially hazardous area. This guarantees protection for anyone who needs to enter potentially hazardous areas.

### Installation example



## Insertion funnel NP/TP

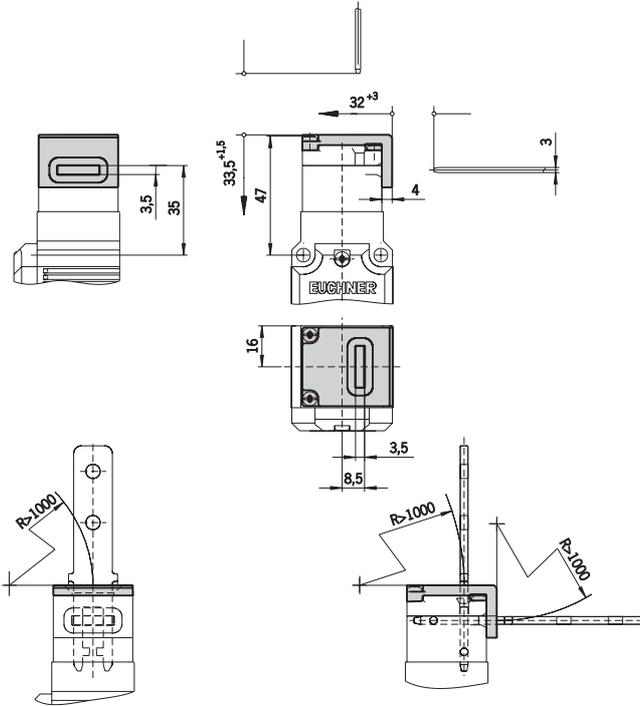
(for safety switches NP/TP)

Type	Cat. No.
Insertion funnel NP/TP	086 237

The insertion funnel provides the actuator with a wider entry area into the safety switch. With the insertion funnel the switch head is better protected against damage. M3x34 Plastite screws (supplied) are used to secure it to the actuation head.

### Notes

- ▶ May only be used in conjunction with safety switches NP...A and TP...A (switches without top entry overtravel)
- ▶ The insertion funnel can only be used in combination with an overtravel actuator.
- ▶ It may only be secured to the actuation head with the 3 x 34 Plastite screws supplied



## Safety screws

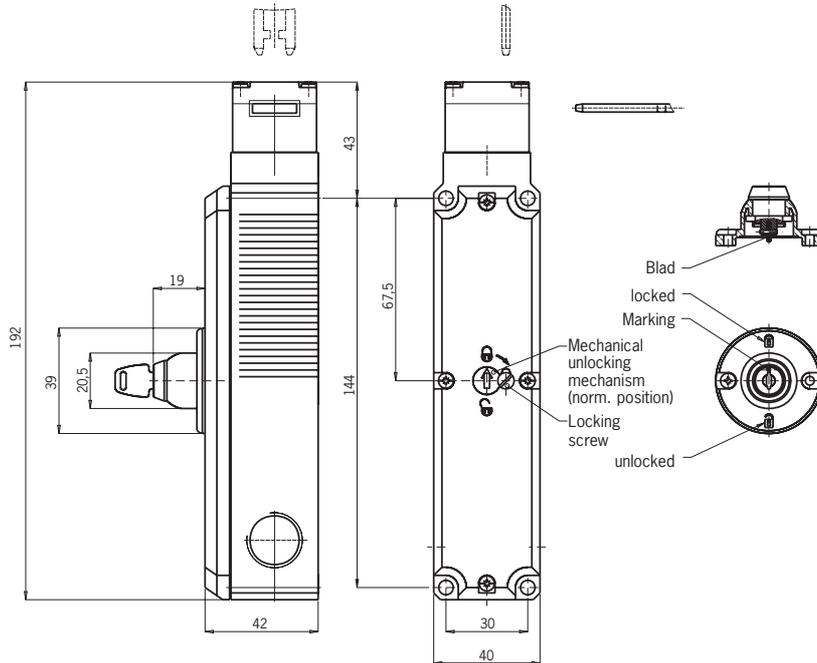
Screw type	Use	Packaging unit	Type	Cat. No.
M5x10 Material stainless steel	<ul style="list-style-type: none"> <li>▶ for straight actuator</li> <li>▶ for bent actuator</li> <li>▶ for hinged actuators for right and left hinged doors</li> </ul>	100 pieces	M5x10/V100	086 231
M5x25	<ul style="list-style-type: none"> <li>▶ for hinged actuators for top and bottom hinged doors</li> </ul>	100 pieces	M5x25/V100	073 457
M4x14 Material stainless steel	<ul style="list-style-type: none"> <li>▶ for straight actuator/ bent with bush</li> </ul>	100 pieces	M4x14/V100	086 232
3x30 (self-tapping screw)	<ul style="list-style-type: none"> <li>▶ for actuation heads NP...A, TP...A</li> </ul>	100 pieces	3x30/V100	075 532

## Replacement screws (not safety screws)

Screw type	Use	Packaging unit	Type	Cat. No.
3x30 (self-tapping screw) Material stainless steel	<ul style="list-style-type: none"> <li>▶ for actuation heads NP...A, TP...A</li> </ul>	100 pieces	3x30/V100	082 237
3x38 (self-tapping screw)	<ul style="list-style-type: none"> <li>▶ for actuation heads NP...K, TP...K</li> </ul>	100 pieces	3x38/V100	076 755

## Lock (mechanical key unlocking mechanism)

### Dimension drawing



### Warning

The two locks listed as Cat. No. 084 177 and 086 236 are only suitable for safety switches TP with metric thread as listed in this catalogue.

### Application

The lock is used in combination with TP safety switch .

The keyed unlocking mechanism provides authorized personnel with ability to disengage the solenoid with a specific key.

The unlocking mechanism holds the solenoid in the unlocked position.

### Installation

Two screws are used to fix the lock to the cover of the TP safety switch (onto the mechanical unlocking mechanism).

### Notes

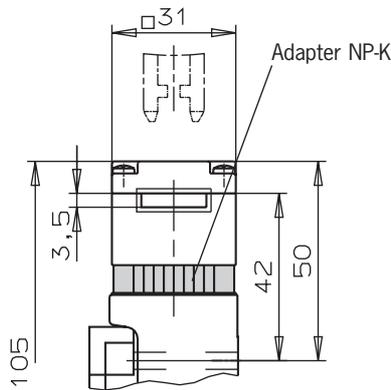
- ▶ Please order TP safety switch separately
- ▶ 2 keys are included
- ▶ All TP safety switches can be retrofitted with the key release

### Ordering table

Description	Cat. No.
Unique lock TP (unique key needed to open)	084 177
Identical lock TP (standard key opens all locks)	086 236
Replacement standard keys (2x) for identical locks	077 206

## Adapter NP-K for safety switch NP

### Dimension drawing



### Application

Adapter NP-K is used for top entry overtravel applications for the safety switch NP.. only.

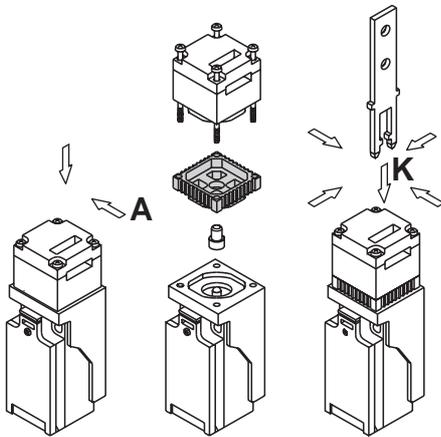
### Notes

- ▶ The adapter **cannot** be used for TP series of safety switches
- ▶ 4 screws 3 x 38 (not safety screws) are supplied

### Ordering table

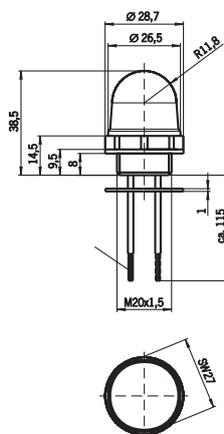
Type	Cat. No.
Adapter NP-K	074 578

### Assembly



## Built-in LED

### Dimension drawing



### Application

The built-in LED is suitable for direct installation in the M20x1.5 thread, one of the three cable entries in safety switch TP...

The built-in LED can indicate to the user whether the solenoid is locked/unlocked or whether the door is open/closed.

The switching element can be wired individually.

### Technical data

Parameters	Value
LED color	red
Connection	2 connection cables
Screw-in thread	M20x1 .5
Operating voltage/	DC 24 V / 45 mA
Current consumption	AC 115 V / 15 mA
	AC 230 V / 15 mA
Degree of protection	IP 65

### Ordering table

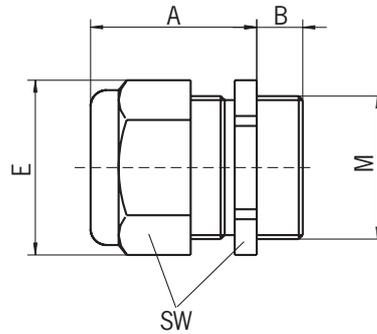
Type	Cat. No.
Built-in LED	087 423

## Cable glands (plastic)

The cable gland table below shows the cable diameter and the dimensions used with the EUCHNER NP...M and TP...M safety switches.

M	Outer cable diameter D	A	B	E	SW	Type	Cat. No.
M20 X 1.5	6-12	max. 28	11	27	24	EKPM20/06	086 233

Data in mm



## M12 plug connector (8-pole socket) with connection cable For TP...C1992 safety switches

Socket pin	Wire color
1	WH
2	BN
3	GN
4	YE
5	GY
6	PK
7	BU
8	RD

View of connection side of 8-pole socket plug

Side view of the connector with cable, showing dimensions: cable length 'l', outer diameter of the cable 'Ø 6', and the diameter of the connector housing 'Ø 14'.

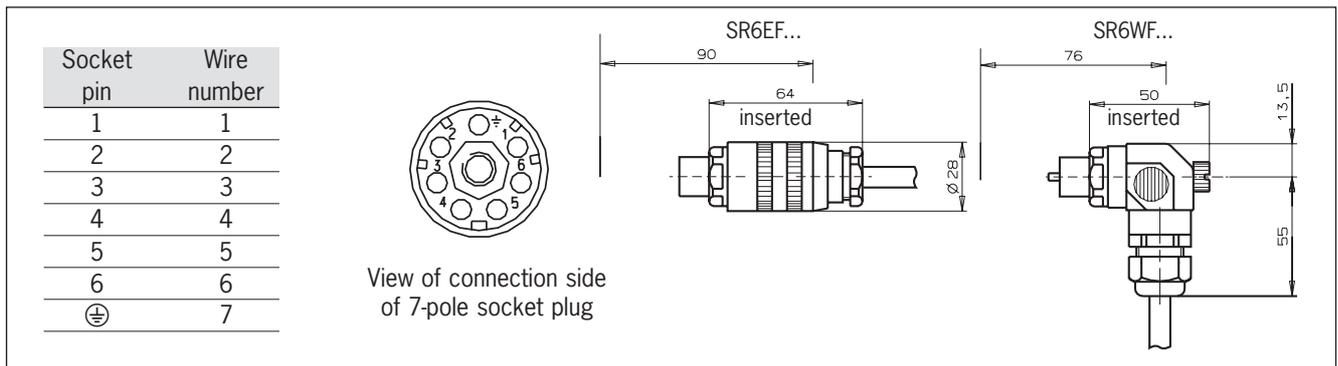
### Technical data

Parameters	Value
Plug connector	Straight 8-pole M12 socket plug Screw connection Connecting knurled nut connected to cable screen
Connection cable	8 x 0.25 mm <sup>2</sup> screened Outer sheath PVC

### Ordering table

Cable length "l"	Cat. No.
5 m	077 751
10 m	077 752
15 m	077 753
20 m	077 871
25 m	077 872
50 m	077 873

## Plug connector SR6 (socket 6+PE) with / without connection cable



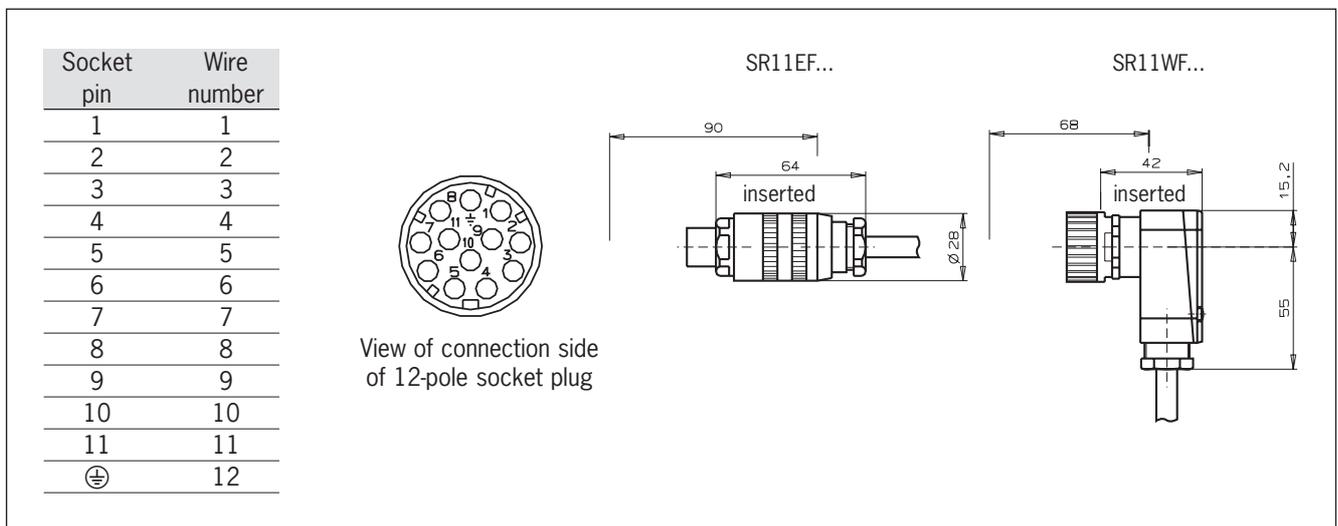
### Technical data

Parameters	Value
Housing material	plastic
Number of poles	6 + PE
Nominal voltage	250 V <sub>≅</sub>
Degree of protection to IEC 60,529	IP65 /inserted)
Connection cable	PUR grey
Outer diameter	∅ 8 mm
Wire cross-section	1.0 mm <sup>2</sup>

### Ordering table

Plug version	Connection cable	Type designation	Cat. No.
Socket straight	None	SR6EF	013 176
	5 m	SR6EF-5000	077 632
	10 m	SR6EF-10000	077 633
Socket right angle	15 m	SR6EF-15000	077 634
	None	SR6WF	024 999
	5 m	SR6WF-5000	077 638
Socket right angle	10 m	SR6WF-10000	077 639
	15 m	SR6WF-15000	077 640

## Plug connector SR11 (socket 11+PE) with / without connection cable



### Technical data

Parameters	Value
Housing material	plastic
Number of poles	11 + PE
Nominal voltage	50 V <sub>≅</sub>
Degree of protection to IEC 60,529	IP65 /inserted)
Connection cable	PUR grey
Outer diameter	∅ 10.5 mm
Wire cross-section	1.0 mm <sup>2</sup>

### Ordering table

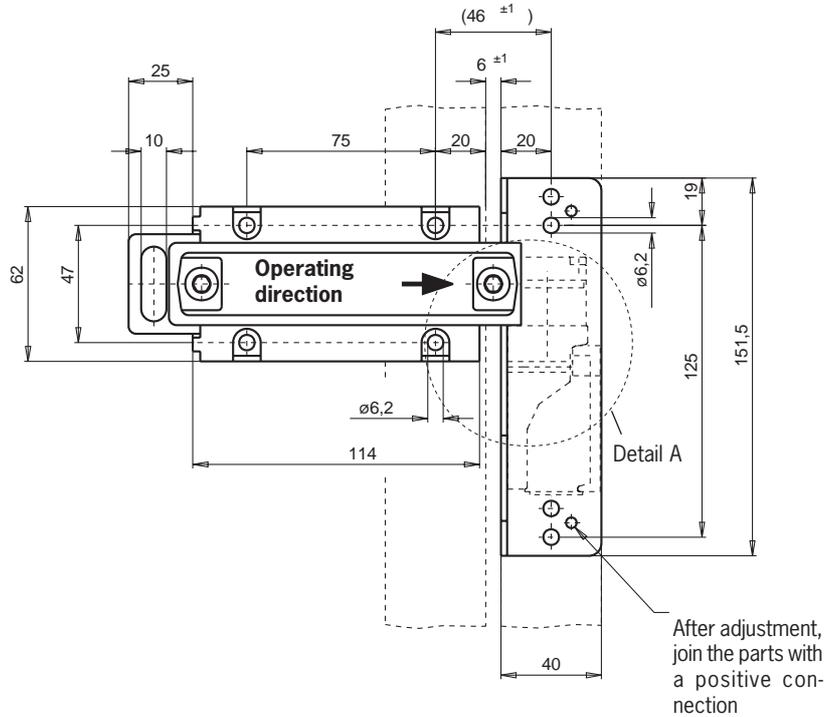
Plug version	Connection cable	Type designation	Cat. No.
Socket straight	None	SR11EF	070 859
	5 m	SR11EF-5000	077 629
	10 m	SR11EF-10000	077 630
Socket right angle	15 m	SR11EF-15000	077 631
	None	SR11WF	054 773
	5 m	SR11WF-5000	077 635
Socket right angle	10 m	SR11WF-10000	077 636
	15 m	SR11WF-15000	077 637

## Bolt NP

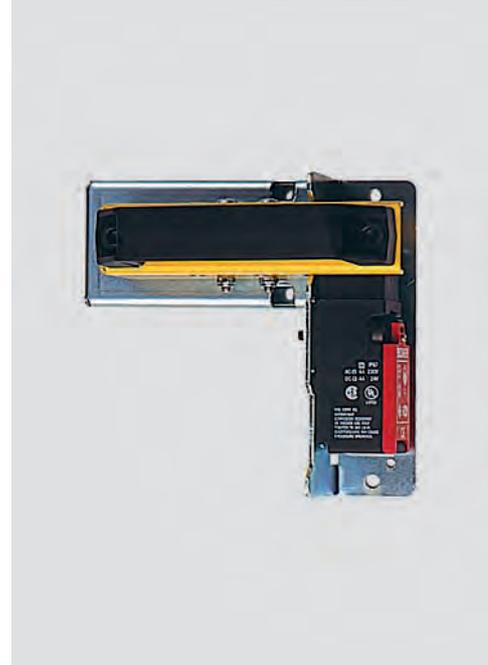
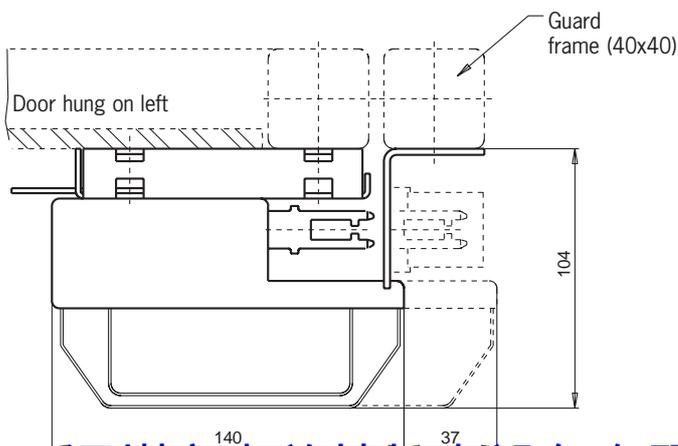
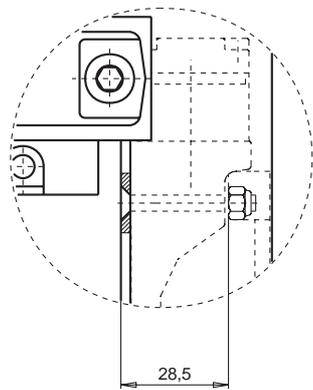
► For NP...AS safety switches

### Dimension drawing

Bolt NP for right or left hinged doors



#### Detail A



### Characteristics

- Easy screw fitting to both aluminum extruded profiles and machine guards
- Distinctive yellow color for easy recognition
- Symmetrical design for right-hinged or left-hinged doors
- No additional door handle necessary
- Automatic snap-in function to retain position of the bolt when pushed to its locked position (only at version **Bolt 1 NP/TP**)
- Snap-in mechanism prevents unintentional opening of the hinged door
- Extended hole at the bolt permits fixing of padlocks
- Bolt for safety switch **NP...AS** and **TP...A** is identical

### Notes

- Only type NP...AS can be mounted on the switch bracket NP.
- Actuator included
- Please order safety switch and switch bracket separately

### Ordering table

Series	Cat. No.
<b>Bolt 0 NP/TP</b> without snap-in function	073 535
<b>Bolt 1 NP/TP</b> with snap-in mechanism, 1 x snap-in function closed	073 536
<b>Switch bracket NP</b>	073 538

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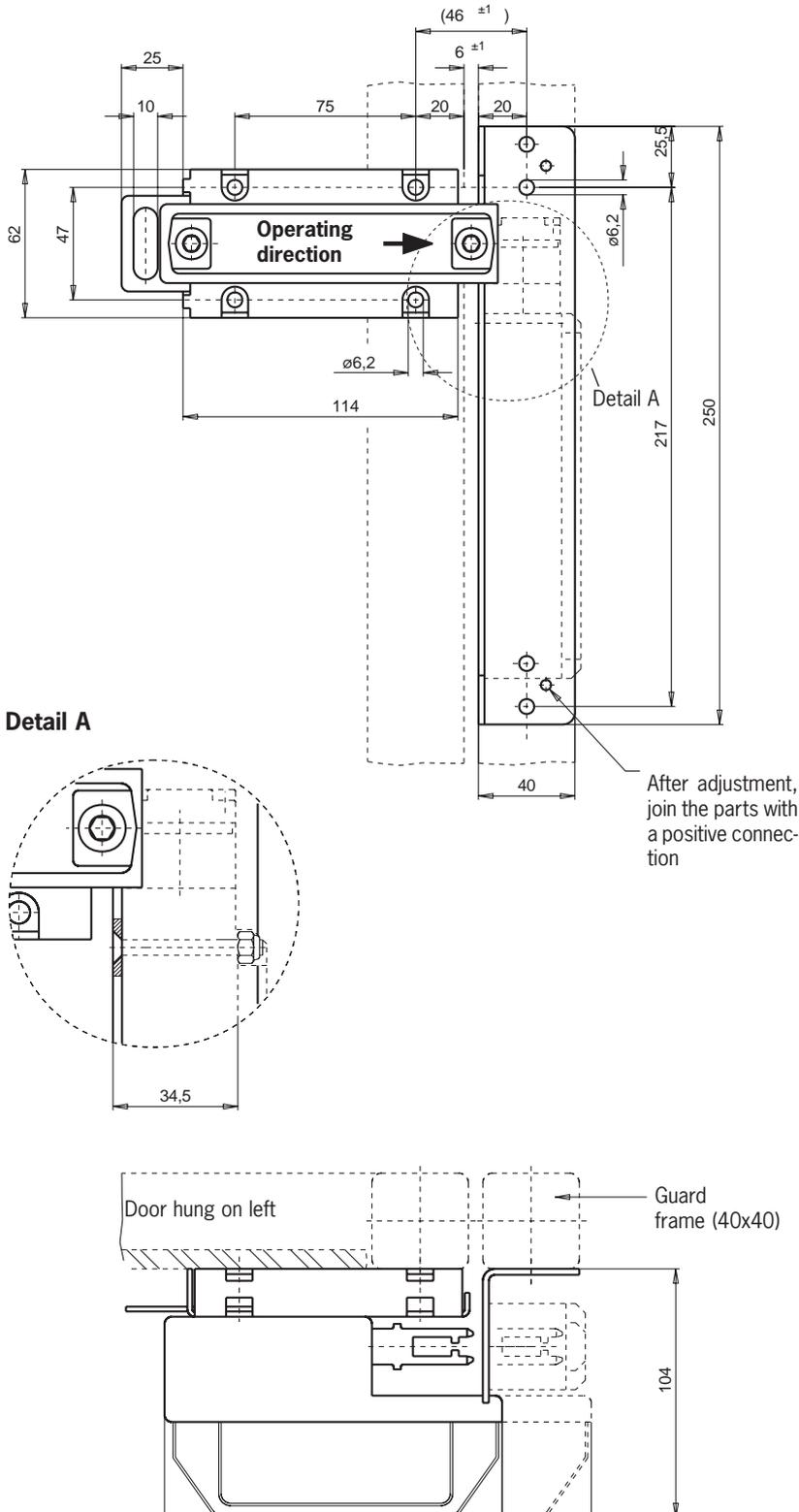
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## Bolt TP

► For TP...A safety switches

### Dimension drawing

Bolt TP for right or left hinged doors



### Characteristics

- Easily installed to both aluminum extruded profiles and machine guards
- Distinctive yellow color for easy recognition
- Symmetrical design for right-hinged or left-hinged doors
- No additional door handle necessary
- Automatic snap-in function to retain position of the bolt when pushed to its locked position (only at version **Bolt 1 NP/TP**)
- Snap-in mechanism prevents unintentional opening of the hinged door
- Extended hole at the bolt permits fixing of padlocks

### Notes

- The TP switch must be turned to A approach direction for proper mounting.
- Bolt for safety switch **NP...AS** and **TP...A** are identical
- Actuator included
- Please order safety switch and switch bracket separately

### Ordering table

Series	Cat. No.
<b>Bolt 0 NP/TP</b> without snap-in function	073 535
<b>Bolt 1 NP/TP</b> with snap-in function, 1 x snap-in function closed	073 536
<b>Switch bracket TP</b>	073 539

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## Bolt with emergency release for escape from the hazardous area

### Bolts with an emergency release offer the following important advantages:

- ▶ Bolts with an emergency release allow the operator to open the closed safety guard and escape from the hazardous area.
  - ▶ Protection for the operator in an emergency.

If there is a risk that someone may be accidentally locked into an accessible hazardous area, the EU Machinery Directive stipulates: *“Machines must be designed, built and equipped in such a manner that the person at risk will not remain locked into the machine, or, if this is not possible, can call for help”.*

In the case of safety switches with a guard-locking device, the German trade association recommends the use of a manually operated emergency release in accordance with BGI 575. With the emergency release, the guard-locking device can be disabled from the inside in case of danger. The emergency release for the safety switch must be within easy reach inside the hazardous area and must be operable without the need of any other tools.

Figure 1 shows safety switch TP... used in conjunction with bolt TP-F with an emergency release into the back of the switch. With this combination, the emergency release is operated by turning lever (figure 1, **A**) and slide bolt (figure 1, **B**).

With the safety switch in normal mode (rotary lever in locked position), the operator can start the locking process. If someone is inside the hazardous area and the door is accidentally closed and locked, this could pose a serious threat to the individual.



Fig. 1: Safety switch with bolt (rear view)

By turning the lever (emergency release, figure 2, **1**), the person locked in can trigger the safety switch's mechanical unlocking system. The solenoid monitoring contacts are forced open. The safety circuit is interrupted and a command to stop the machine operation is triggered.

The slide bolt (figure 2, **2**) allows the actuator to be pulled out of the safety switch so the exit door can be opened.



Fig. 2: Emergency release with lever activated

In order to prevent anyone from being locking into the hazardous area, the following precautions should be taken when using bolt TP-F.

- ▶ Padlock (figure 3, **C**)  
The bolt tongue has an oblong slot which holds up to three padlocks. When service work is being carried out, the doors cannot be locked thus the machine cannot be started by third parties.
- ▶ Detent knob (figure 3, **D**)  
Operators who tend to monitor the processes closely and temporary enter into the machine pose a high level of risk. In order to take positive action to prevent anyone from accidentally being locking inside a hazardous area, a detent knob must be pulled to slide the actuator into the safety switch.

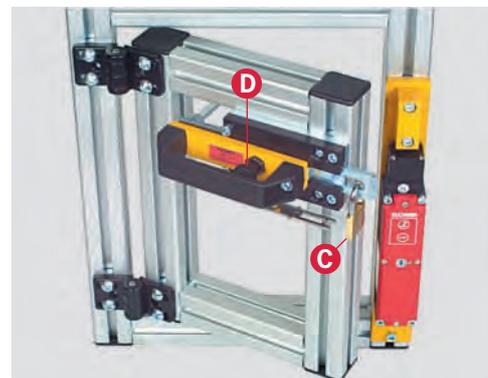


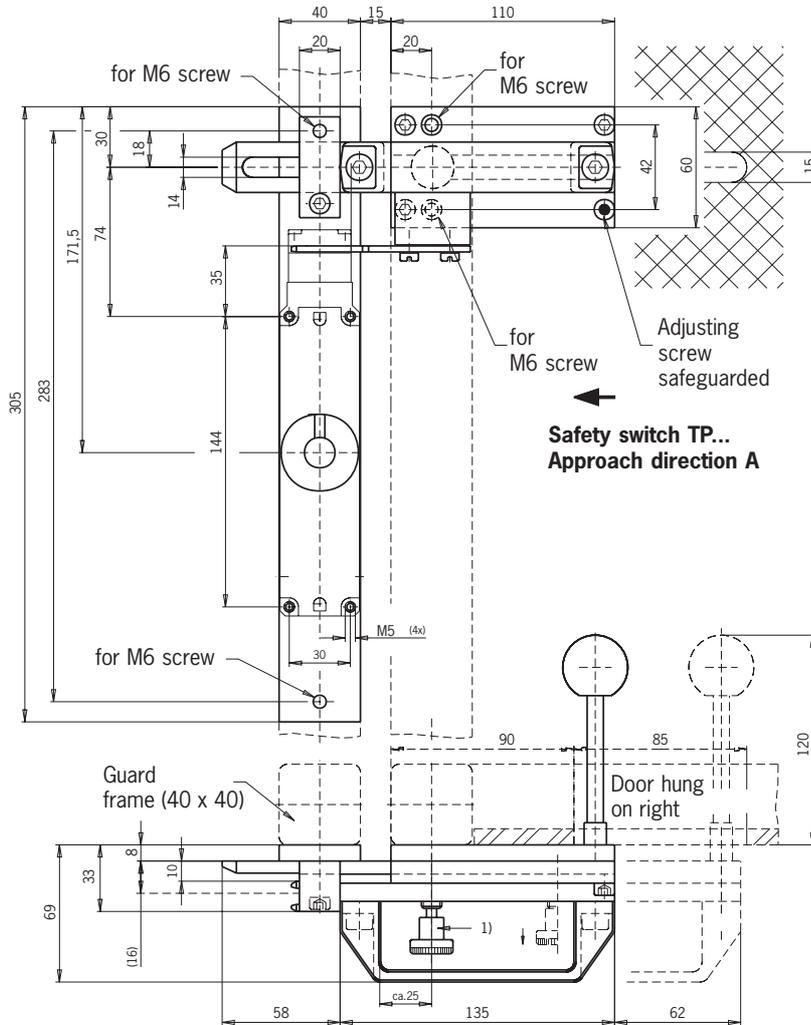
Fig. 3: Padlock and detent knob

## Bolt TP-.F

- ▶ For safety switches with emergency release TP...A.-C1743 and TP...A.-C1993
- ▶ Emergency release lever to escape from out of the hazardous area

### Dimension drawing

Bolt TP-AF with emergency release for right hinged doors



- 1) Bolt with snap-in mechanism. When the bolt is open the knob snaps into position preventing unintended closure. Pulling the snap-in knob upward allows for closure of the bolt.



### Features

- ▶ Bolt with snap-in
- ▶ When the bolt is open the knob snaps into position preventing unintended closure.

### Characteristics

- ▶ Easy screw fitting to both aluminum extruded profiles and machine guards
- ▶ Distinctive yellow color for easy recognition
- ▶ Robust version for heavy doors
- ▶ No additional door handle necessary
- ▶ Extended hole at the bolt permits fixing of padlocks

### Notes

- ▶ The TP switch must be turned to A approach direction for proper mounting.
- ▶ Actuator included
- ▶ Please order safety switch separately

### Ordering table

Series	Cat. No.
<b>Bolt TP-AF</b> (with emergency release) for right hinged doors	086 186
<b>Bolt TP-CF</b> (with emergency release) for left hinged doors	086 188
<b>Bolt TP-A</b> (without emergency release) for right hinged doors	084 430
<b>Bolt TP-C</b> (without emergency release) for left hinged doors	084 432

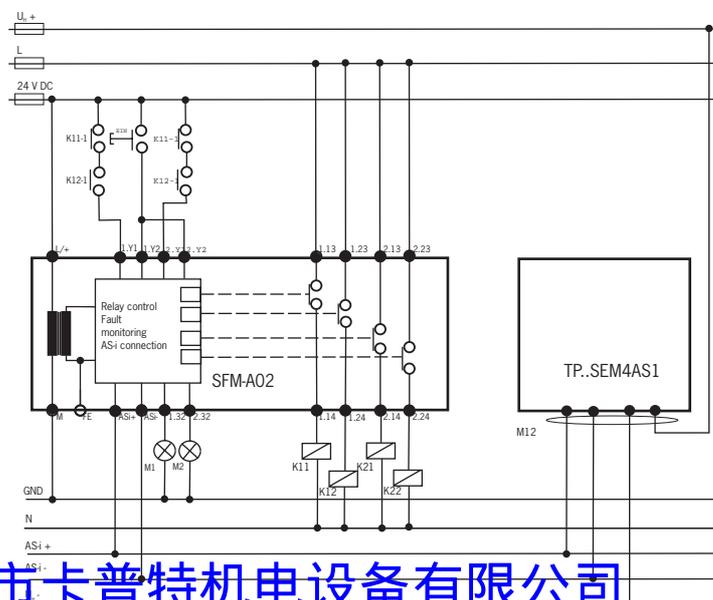
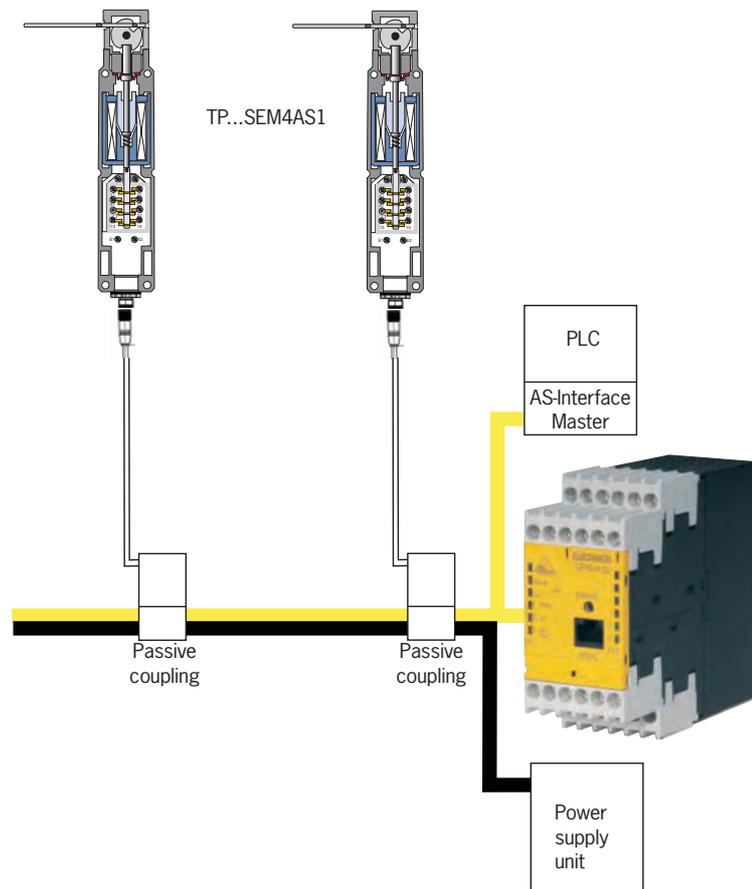
## Appendix

### Sample applications

#### Connection of safety switch TP...SEM4AS1 to AS-Interface Safety at Work

##### Process protection

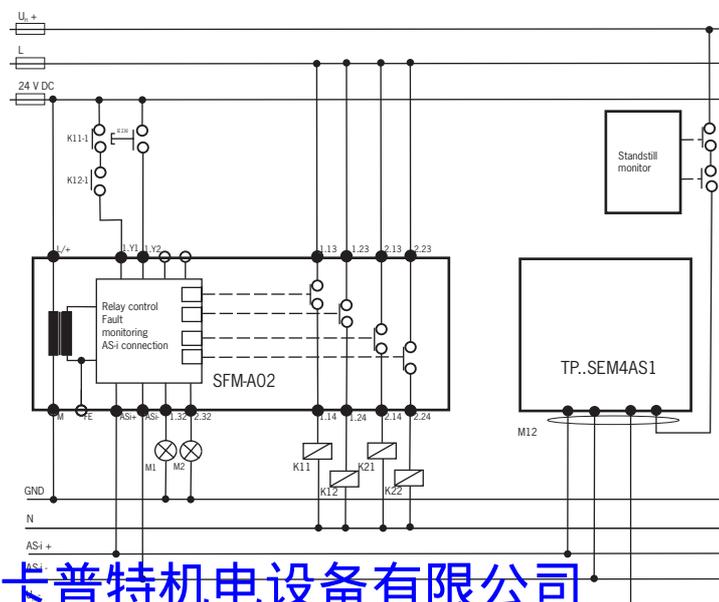
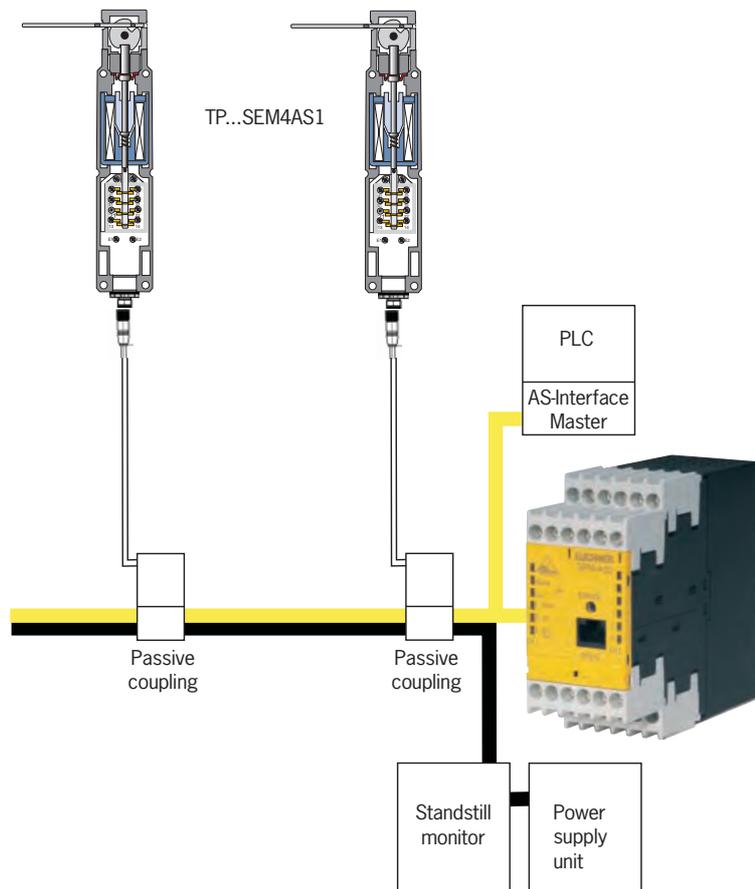
(a safety monitor SFM... must be used)



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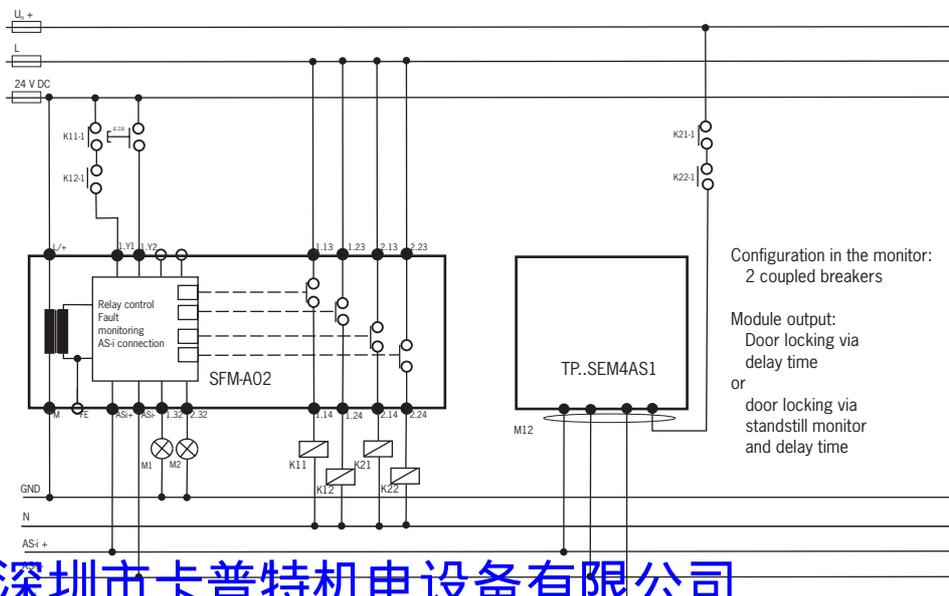
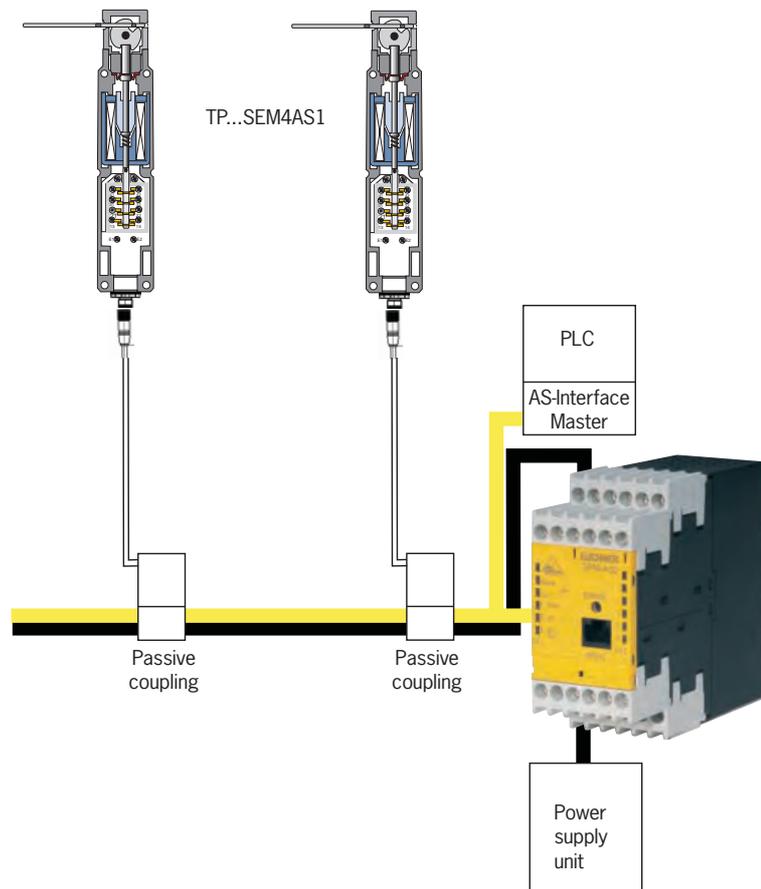
## Connection of safety switch TP...SEM4AS1 to AS-Interface Safety at Work

**Personal protection with standstill monitor**  
 (a safety monitor SFM-... must be used)



## Connection of safety switch TP...SEM4AS1 to AS-Interface Safety at Work

**Personal protection using safety monitor for safe time control**  
 (a safety monitor SFM-... must be used)



Configuration in the monitor:  
2 coupled breakers

Module output:  
Door locking via  
delay time  
or  
door locking via  
standstill monitor  
and delay time

## Index sorted by type designation

Type designation	Cat. No.	Page	Type designation	Cat. No.	Page
10m connection cable with M12 (8-pole)	077752	46	SR6WF-15000	077640	47
15m connection cable with M12 (8-pole)	077753	46	SR6WF-5000	077638	47
20m connection cable with M12 (8-pole)	077871	46	TP1-4131A024M	084115	19
25m connection cable with M12 (8-pole)	077872	46	TP1-4131A024SR11	088202	19
3X30/V100	075532	43	TP1-4131A110M	084116	19
3X30/V100	082237	43	TP1-4131A230M	084117	19
3X38/V100	076755	43	TP1-4131K024M	084150	21
50m connection cable with M12 (8-pole)	077873	46	TP1-4131K024SR11	088217	21
5m connection cable with M12 (8-pole)	077751	46	TP1-4131K110M	084254	21
ADAPTER NP-K	074578	45	TP1-528A024M	084255	21
ACTUATOR-P-G	059226	38	TP1-528A024SR6	084295	15
ACTUATOR-P-GN	074570	39	TP1-528A024SR6	087431	15
ACTUATOR-P-GNT	074576	40	TP1-528A110M	084300	15
ACTUATOR-P-GT	070046	40	TP1-528A110SR6	087435	15
ACTUATOR-P-W	059227	38	TP1-528A230M	084304	15
ACTUATOR-P-WN	074571	39	TP1-528A230SR6	087438	15
ACTUATOR-P-WNT	074577	40	TP1-528K024M	084342	17
ACTUATOR-P-WT	070038	40	TP1-528K024SR6	088210	17
BUILT-IN LED	087423	45	TP1-538A024M	084310	15
INSERTION FUNNEL NP / TP	086237	42	TP1-538A024SR6	087433	15
EKPM20/06	086233	46	TP1-538A110M	084315	15
REPLACEMENT KEYS FOR IDENTICAL LOCKS	077206	44	TP1-538A110SR6	087436	15
M4X14/V100	086232	43	TP1-538A230M	084320	15
M5X10/V100	086231	43	TP1-538A230SR6	087439	15
M5X25/V100	073457	43	TP1-538K024M	084343	17
NP1-618AB-M	083680	9	TP1-538K024SR6	088212	17
NP1-618AS-M	083685	9	TP2-4131A024M	084125	19
NP1-628AB-M	083686	9	TP2-4131A024SR11	088203	19
NP1-628AS-M	083688	9	TP2-4131A110M	084126	19
NP1-638AB-M	083690	9	TP2-4131A230M	084128	19
NP1-638AS-M	083691	9	TP2-4131K024M	084253	21
NP1-648AB-M	082276	9	TP2-4131K024SR11	088218	21
NP1-648AS-M	082280	9	TP2-528A024M	084325	15
NP2-628AB	059448	9	TP2-528A024SR6	087441	15
NP2-628AS	059447	9	TP2-528A110M	084330	15
NP2-638AB	059450	9	TP2-528A110SR6	087444	15
NP2-638AS	059449	9	TP2-528A230M	084332	15
HINGED ACTUATOR P-LR	059440	38	TP2-528A230SR6	087448	15
HINGED ACTUATOR P-LRN	074573	39	TP2-528K024M	084344	17
HINGED ACTUATOR P-OU	070050	38	TP2-528K024SR6	088214	17
HINGED ACTUATOR P-OUN	074572	39	TP2-538A024M	084333	15
LATCH SPRING NP / TP	076501	41	TP2-538A024SR6	087442	15
BOLT 0 NP / TP	073535	48	TP2-538A110M	084334	15
BOLT 0 NP / TP	073535	49	TP2-538A110SR6	087446	15
BOLT 1 NP / TP	073536	48	TP2-538A230M	084335	15
BOLT 1 NP / TP	073536	49	TP2-538A230SR6	087449	15
BOLT TP-A	084430	51	TP2-538K024M	084346	17
BOLT TP-AF	086186	51	TP2-538K024SR6	088215	17
BOLT TP-C	084432	51	TP3-2131A024M	084142	23
BOLT TP-CF	086188	51	TP3-2131A024MC1743	084285	30
SWITCH BRACKET NP	073538	48	TP3-2131A024MC1761	084290	29
SWITCH BRACKET TP	073539	49	TP3-2131A024MC1993	087400	31
IDENTICAL LOCK TP	086236	44	TP3-2131A024SR11	088205	23
UNIQUE LOCK TP	084177	44	TP3-2131A110M	084143	23
LOCKOUT BAR P	070651	41	TP3-2131A230M	084144	23
SR11EF	070859	47	TP3-2131K024M	084264	25
SR11EF-10000	077630	47	TP3-2131K024SR11	088220	25
SR11EF-15000	077631	47	TP3-2131K230M	084265	25
SR11EF-5000	077629	47	TP3-4121A024M	084135	23
SR11WF	054773	47	TP3-4121A024MC1743	087427	30
SR11WF-10000	077636	47	TP3-4121A024SR11	088206	23
SR11WF-15000	077637	47	TP3-4121A110M	084137	23
SR11WF-5000	077635	47	TP3-4121A230M	084138	23
SR6EF	013176	47	TP3-4121K024M	084260	25
SR6EF-10000	077633	47	TP3-4121K024SR11	088221	25
SR6EF-15000	077634	47	TP3-4121K230M	084262	25
SR6EF-5000	077632	47	TP3-4131A024M	084129	23
SR6WF	024999	47	TP3-4131A024SR11	088204	23
SR6WF-10000	077429	47	TP3-4131A110M	084130	23

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## Index sorted by catalogue number

Type designation	Cat. No.	Page	Cat. No.	Type designation	Page
TP3-4131A230M	084131	23	013176	SR6EF	47
TP3-4131K024M	084256	25	024999	SR6WF	47
TP3-4131K024SR11	088219	25	054773	SR11WF	47
TP3-4131K110M	084257	25	059226	ACTUATOR-P-G	38
TP3-4131K230M	084258	25	059227	ACTUATOR-P-W	38
TP3-4141A024M	084270	28	059440	HINGED ACTUATOR P-LR	38
TP3-4141HA024SEM4AS1	088256	37	059447	NP2-628AS	9
TP3-4141HA024SM4C2012	087425	35	059448	NP2-628AB	9
TP3-4141HA024SM4C2013	087426	35	059449	NP2-638AS	9
TP3-4141HA024SM8C1992	087377	33	059450	NP2-638AB	9
TP3-537A024M	084336	15	070038	ACTUATOR-P-WT	40
TP3-537A024SR6	087434	15	070046	ACTUATOR-P-GT	40
TP3-537A110M	084337	15	070050	HINGED ACTUATOR P-OU	38
TP3-537A110SR6	087437	15	070651	LOCKOUT BAR P	41
TP3-537A230M	084338	15	070859	SR11EF	47
TP3-537A230SR6	087440	15	073457	M5X25/V100	43
TP3-537K024M	084347	17	073535	BOLT 0 NP / TP	48
TP3-537K024SR6	088213	17	073535	BOLT 0 NP / TP	49
TP4-2131A024M	084145	23	073536	BOLT 1 NP / TP	48
TP4-2131A024SR11	088208	23	073536	BOLT 1 NP / TP	49
TP4-2131A110M	084147	23	073538	SWITCH BRACKET NP	48
TP4-2131A230M	084148	23	073539	SWITCH BRACKET TP	49
TP4-2131K024M	084266	25	074570	ACTUATOR-P-GN	39
TP4-2131K024SR11	088223	25	074571	ACTUATOR-P-WN	39
TP4-4121A024M	084139	23	074572	HINGED ACTUATOR P-OUN	39
TP4-4121A024SR11	088209	23	074573	HINGED ACTUATOR P-LRN	39
TP4-4121A110M	084140	23	074576	ACTUATOR-P-GNT	40
TP4-4121A230M	084141	23	074577	ACTUATOR-P-WNT	40
TP4-4121K024M	084263	25	074578	ADAPTER NP-K	45
TP4-4121K024SR11	088224	25	075532	3X30/V100	43
TP4-4131A024M	084132	23	076501	LATCH SPRING NP / TP	41
TP4-4131A024SR11	088207	23	076755	3X38/V100	43
TP4-4131A110M	084133	23	077206	REPLACEMENT KEYS FOR IDENTICAL LOCKS	44
TP4-4131A230M	084134	23	077629	SR11EF-5000	47
TP4-4131K024M	084259	25	077630	SR11EF-10000	47
TP4-4131K024SR11	088222	25	077631	SR11EF-15000	47
TP4-4141A024M	084275	28	077632	SR6EF-5000	47
TP4-4141HA024SEM4AS1	088257	37	077633	SR6EF-10000	47
TP4-4141HA024SM8 C1992	087378	33	077634	SR6EF-15000	47
TP4-537A024M	084339	15	077635	SR11WF-5000	47
TP4-537A024SR6	087443	15	077636	SR11WF-10000	47
TP4-537A110M	084340	15	077637	SR11WF-15000	47
TP4-537A110SR6	087447	15	077638	SR6WF-5000	47
TP4-537A230M	084341	15	077639	SR6WF-10000	47
TP4-537A230SR6	087450	15	077640	SR6WF-15000	47
TP4-537K024M	084348	17	077751	5m connection cable with M12 (8-pole)	46
TP4-537K024SR6	088216	17	077752	10m connection cable with M12 (8-pole)	46
TP4-537K110M	084349	17	077753	15m connection cable with M12 (8-pole)	46
TP5-4120A024M	084279	27	077871	20m connection cable with M12 (8-pole)	46
TP6-4120A024M	084280	27	077872	25m connection cable with M12 (8-pole)	46
			077873	50m connection cable with M12 (8-pole)	46
			082237	3X30/V100	43
			082276	NP1-648AB-M	9
			082280	NP1-648AS-M	9
			083680	NP1-618AB-M	9
			083685	NP1-618AS-M	9
			083686	NP1-628AB-M	9
			083688	NP1-628AS-M	9
			083690	NP1-638AB-M	9
			083691	NP1-638AS-M	9
			084115	TP1-4131A024M	19
			084116	TP1-4131A110M	19
			084117	TP1-4131A230M	19
			084125	TP2-4131A024M	19
			084126	TP2-4131A110M	19
			084128	TP2-4131A230M	19
			084129	TP3-4131A024M	23
			084130	TP3-4131A110M	23
			084131	TP3-4131A230M	23

深圳市卡普特机电设备有限公司

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Cat. No.	Type designation	Page	Cat. No.	Type designation	Page
084132	TP4-4131A024M	23	086237	INSERTION FUNNEL NP / TP	42
084133	TP4-4131A110M	23	087377	TP3-4141HA024SM8C1992	33
084134	TP4-4131A230M	23	087378	TP4-4141HA024SM8 C1992	33
084135	TP3-4121A024M	23	087400	TP3-2131A024MC1993	31
084137	TP3-4121A110M	23	087423	BUILT-IN LED	45
084138	TP3-4121A230M	23	087425	TP3-4141HA024SM4C2012	35
084139	TP4-4121A024M	23	087426	TP3-4141HA024SM4C2013	35
084140	TP4-4121A110M	23	087427	TP3-4121A024MC1743	30
084141	TP4-4121A230M	23	087431	TP1-528A024SR6	15
084142	TP3-2131A024M	23	087433	TP1-538A024SR6	15
084143	TP3-2131A110M	23	087434	TP3-537A024SR6	15
084144	TP3-2131A230M	23	087435	TP1-528A110SR6	15
084145	TP4-2131A024M	23	087436	TP1-538A110SR6	15
084147	TP4-2131A110M	23	087437	TP3-537A110SR6	15
084148	TP4-2131A230M	23	087438	TP1-528A230SR6	15
084150	TP1-4131K024M	21	087439	TP1-538A230SR6	15
084177	UNIQUE LOCK TP	44	087440	TP3-537A230SR6	15
084253	TP2-4131K024M	21	087441	TP2-528A024SR6	15
084254	TP1-4131K110M	21	087442	TP2-538A024SR6	15
084255	TP1-4131K230M	21	087443	TP4-537A024SR6	15
084256	TP3-4131K024M	25	087444	TP2-528A110SR6	15
084257	TP3-4131K110M	25	087446	TP2-538A110SR6	15
084258	TP3-4131K230M	25	087447	TP4-537A110SR6	15
084259	TP4-4131K024M	25	087448	TP2-528A230SR6	15
084260	TP3-4121K024M	25	087449	TP2-538A230SR6	15
084262	TP3-4121K230M	25	087450	TP4-537A230SR6	15
084263	TP4-4121K024M	25	088202	TP1-4131A024SR11	19
084264	TP3-2131K024M	25	088203	TP2-4131A024SR11	19
084265	TP3-2131K230M	25	088204	TP3-4131A024SR11	23
084266	TP4-2131K024M	25	088205	TP3-2131A024SR11	23
084270	TP3-4141A024M	28	088206	TP3-4121A024SR11	23
084275	TP4-4141A024M	28	088207	TP4-4131A024SR11	23
084279	TP5-4120A024M	27	088208	TP4-2131A024SR11	23
084280	TP6-4120A024M	27	088209	TP4-4121A024SR11	23
084285	TP3-2131A024MC1743	30	088210	TP1-528K024SR6	17
084290	TP3-2131A024MC1761	29	088212	TP1-538K024SR6	17
084295	TP1-528A024M	15	088213	TP3-537K024SR6	17
084300	TP1-528A110M	15	088214	TP2-528K024SR6	17
084304	TP1-528A230M	15	088215	TP2-538K024SR6	17
084310	TP1-538A024M	15	088216	TP4-537K024SR6	17
084315	TP1-538A110M	15	088217	TP1-4131K024SR11	21
084320	TP1-538A230M	15	088218	TP2-4131K024SR11	21
084325	TP2-528A024M	15	088219	TP3-4131K024SR11	25
084330	TP2-528A110M	15	088220	TP3-2131K024SR11	25
084332	TP2-528A230M	15	088221	TP3-4121K024SR11	25
084333	TP2-538A024M	15	088222	TP4-4131K024SR11	25
084334	TP2-538A110M	15	088223	TP4-2131K024SR11	25
084335	TP2-538A230M	15	088224	TP4-4121K024SR11	25
084336	TP3-537A024M	15	088256	TP3-4141HA024SEM4AS1	37
084337	TP3-537A110M	15	088257	TP4-4141HA024SEM4AS1	37
084338	TP3-537A230M	15			
084339	TP4-537A024M	15			
084340	TP4-537A110M	15			
084341	TP4-537A230M	15			
084342	TP1-528K024M	17			
084343	TP1-538K024M	17			
084344	TP2-528K024M	17			
084346	TP2-538K024M	17			
084347	TP3-537K024M	17			
084348	TP4-537K024M	17			
084349	TP4-537K110M	17			
084430	BOLT TP-A	51			
084432	BOLT TP-C	51			
086186	BOLT TP-AF	51			
086188	BOLT TP-CF	51			
086231	M5X10/V100	43			
086232	M4X14/V100	43			
086233	EKPM20/06	46			
086236	IDENTIFICAL LOCK	44			

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