Safety Switches

NP/GP/TP

More than safety.

EUCHNER

More than safety.

Emil Euchner, the company's founder and inventor of the multiple limit switch, circa 1928.

Around the world – the Swabian specialists in motion sequence control for mechanical and systems engineering.

EUCHNER's history began in 1940 with the establishment of an engineering office by Emil Euchner. Since that time, EUCHNER has been involved in the design and development of switchgear for controlling a wide variety of motion sequences in mechanical and systems engineering. In 1953, Emil Euchner founded EUCHNER + Co., a milestone in the company's history. In 1952, he developed the first multiple limit switch – to this day a symbol of the enterprising spirit of this family-owned company.

Automation – Safety – ManMachine

Today, our products range from electromechanical and electronic components to complex system solutions. With this wide range of products we can provide the necessary technologies to offer the right solution for special requirements – regardless of whether these relate to reliable and precise positioning or to components and systems for safety engineering in the automation sector.
EUCHNER products are sold through a world-wide sales network of competent partners. With our closeness to the customer and the guarantee of reliable solutions throughout the globe, we enjoy the confidence of customers all over the world.

Quality, reliability, precision

Quality, reliability and precision are the hallmarks of our corporate philosophy. They represent concepts and values to which we feel totally committed.
At EUCHNER, quality means that all our employees take personal responsibility for the company as a whole and, in particular, for their own field of work. This individual commitment to perfection results in products which are ideally tailored to the customers' needs and the requirements of the market. After all: our customers and their needs are the focus of all our efforts. Through efficient and effective use of resources, the promotion of personal initiative and courage in finding unusual solutions to the benefit of our customers, we ensure a high level of customer satisfaction. We familiarize ourselves with their needs, requirements and products and we learn from the experiences of our customers' own customers.

EUCHNER – More than safety.

Quality – made by EUCHNER

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General Information

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 switches NP, GP are examples 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, GP 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, GP 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, GP and TP (see page 42). The use of this extra component increases the depth of actuator travel and an overtravel actuatdor 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, GP and TP, they can be used in the toughest environmental conditions.

The actuation head in safety switches NP, GP 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 43) 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.

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, GP 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 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, GP and TP, EUCHNER offers bolts which can be fastened to standard profiles with little effort.

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

Your advantages

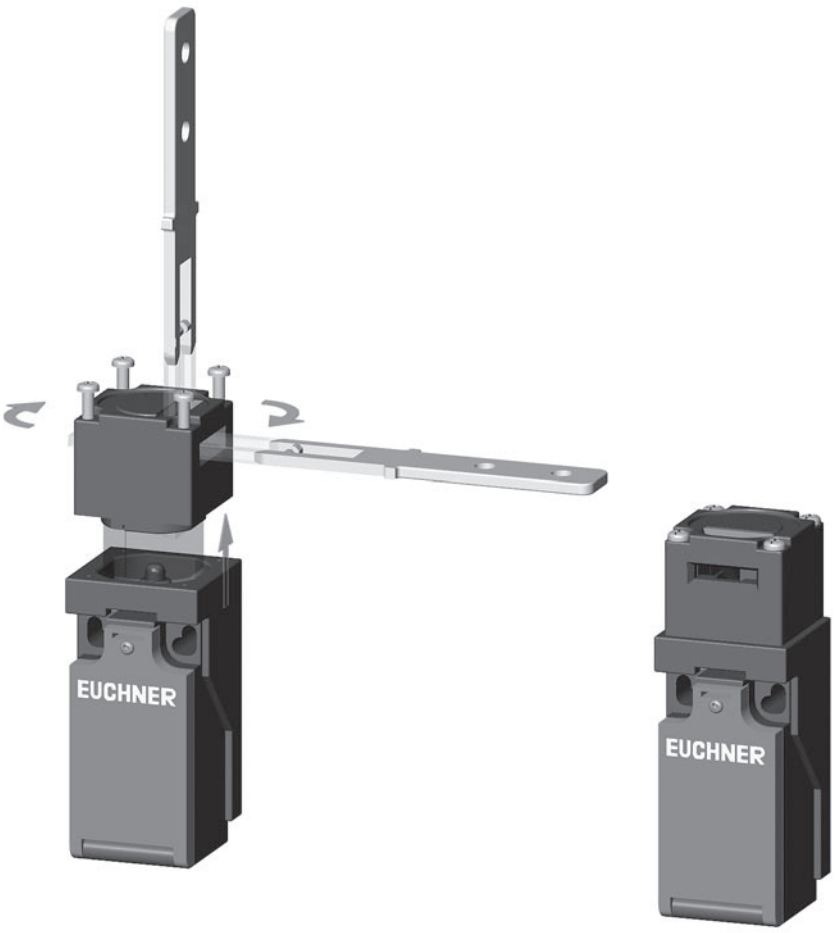
- Safety switches with separate actuator for protecting safety guards
- Fully insulated by glass fiber reinforced thermoplastic
- Degree of protection IP 67
- 4 Lateral approach directions can be changed quickly and conveniently
- 1 Approach direction from top
- Rear actuator head opening facilitates removal of dirt
- The same actuators can be used for NP, GP 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, GP/TP : 40 mm),
  - suitable for aluminum profile assembly
- Attractive design
- Approved by BG, CSA, SAQ, SUVA, UL

Safety switches NP... without guard-locking device

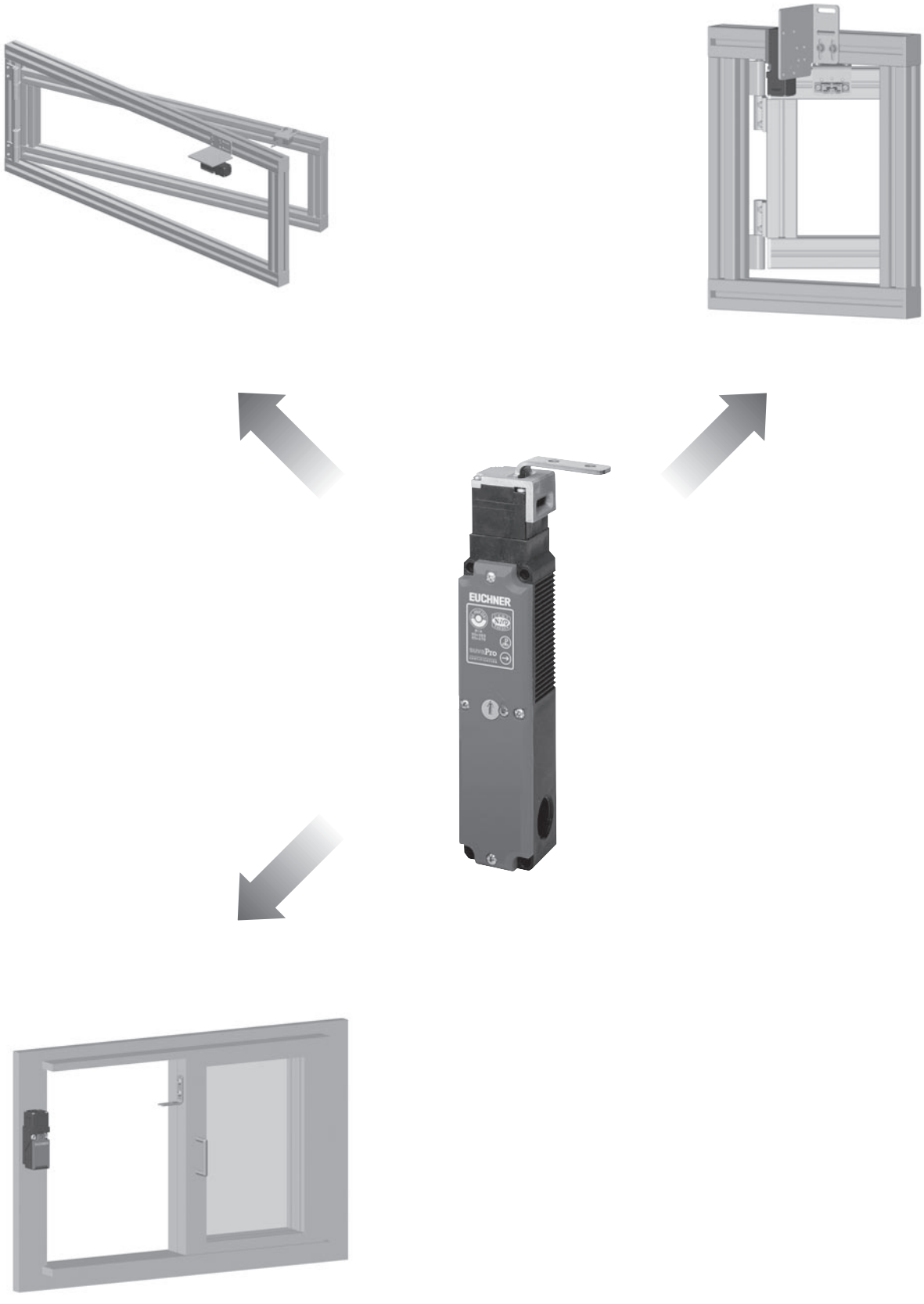
EUCHNER-Safety switches in the NP series ... offer important advantages

- 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



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

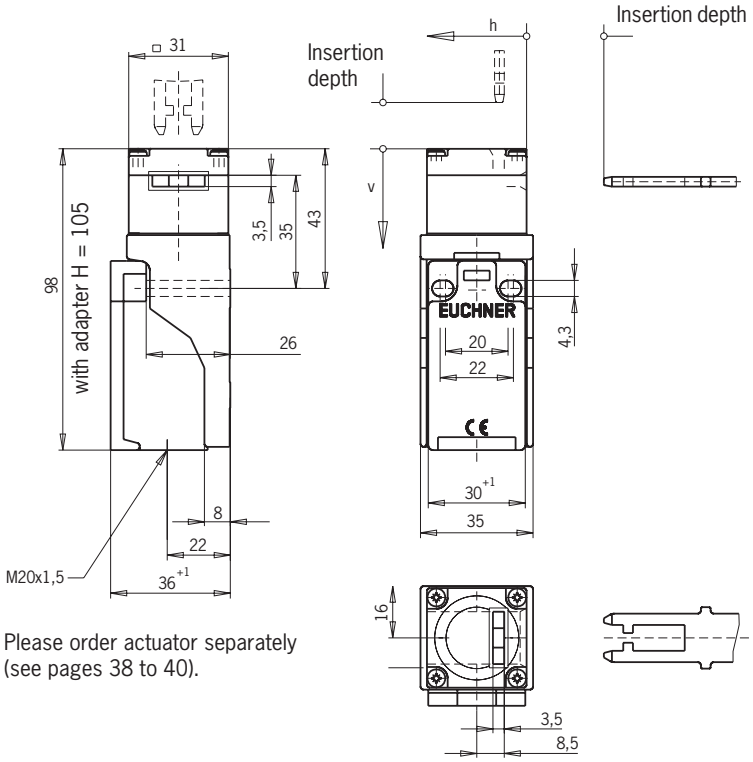


Safety switches NP...

- **With 1, 2 or 3 contact elements**
- **Cable entry M20x1.5 or Plug connector SR6** (relevant plug connectors see page 45)

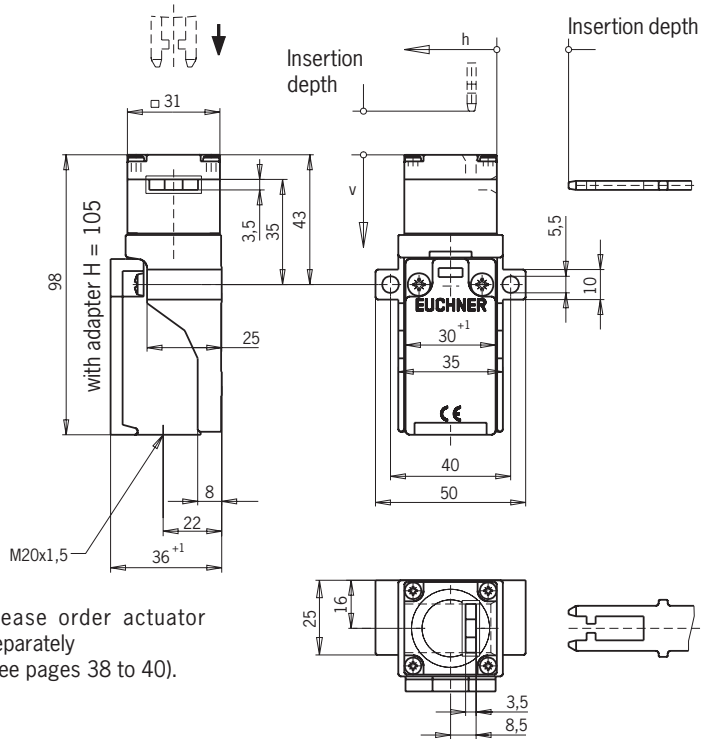
* for cable entry M

Dimension drawing NP1-AS
(Fixing to EN 50047)



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

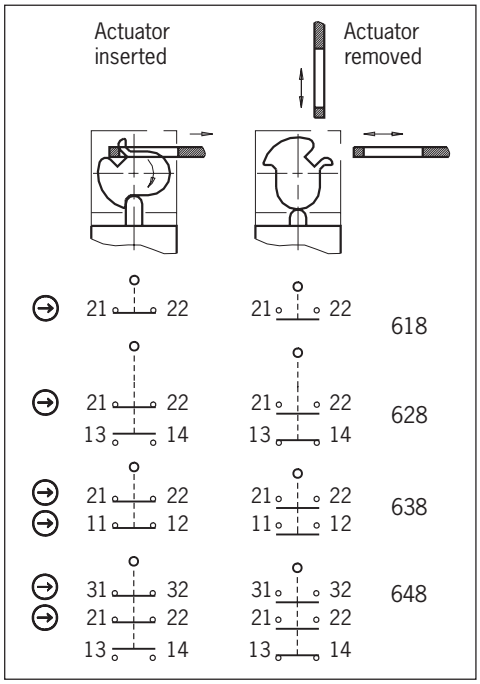
Dimension drawing NP1-AB
(40 mm hole spacing)



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

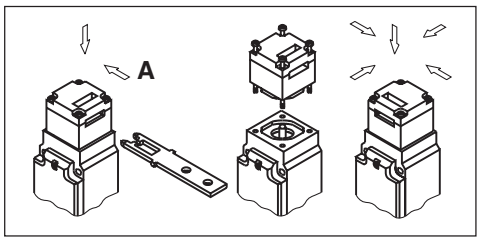
Switching elements
(dependent action contact element)

618 1 positively driven NC contact
628 1 positively driven NC contact + 1 NO contact
638 2 positively driven NC contacts
648 2 positively driven NC contacts + 1 NO contact



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 41) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

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.

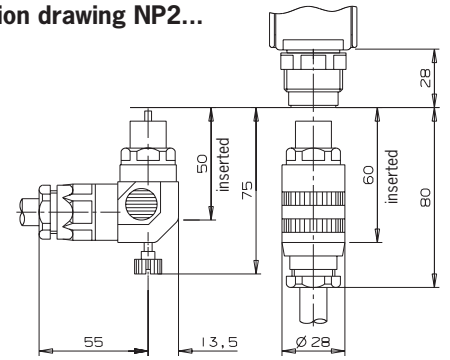


⚠ The complete safety switch must be replaced in the event of faults.

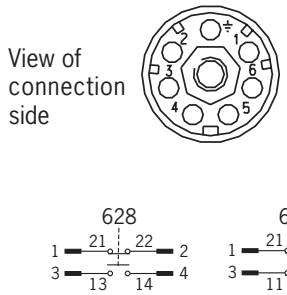
Technical data

Parameters	Value				Unit
Housing material	Glass fiber reinforced thermoplastic				
Degree of protection to IEC 60529	IP 67 for M20x1.5 / IP 65 for SR6				
Mounting position	optional				
Mechanical service life	1 x 10^6 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_{imp}	2.5				kV
Rated insulation voltage U_i	NP1: U_i = 400 / NP2: U_i = 250				V≅
Utilization category to IEC 947-5-1	AC-15 Ie 4 A Ue 230 V / DC-13 Ie 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_{th}	4				A
Short circuit protection (control circuit fuse)	to IEC 60269-1: 4 A gG				
Connection method NP1...	Screw terminal, M20x1.5				
Connection method NP2...	Plug connector SR6				
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm²				
Insertion depth (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 Order No. 074 578 / page 45		mm

Dimension drawing NP2...



Pin assignment NP2...



Ordering table

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

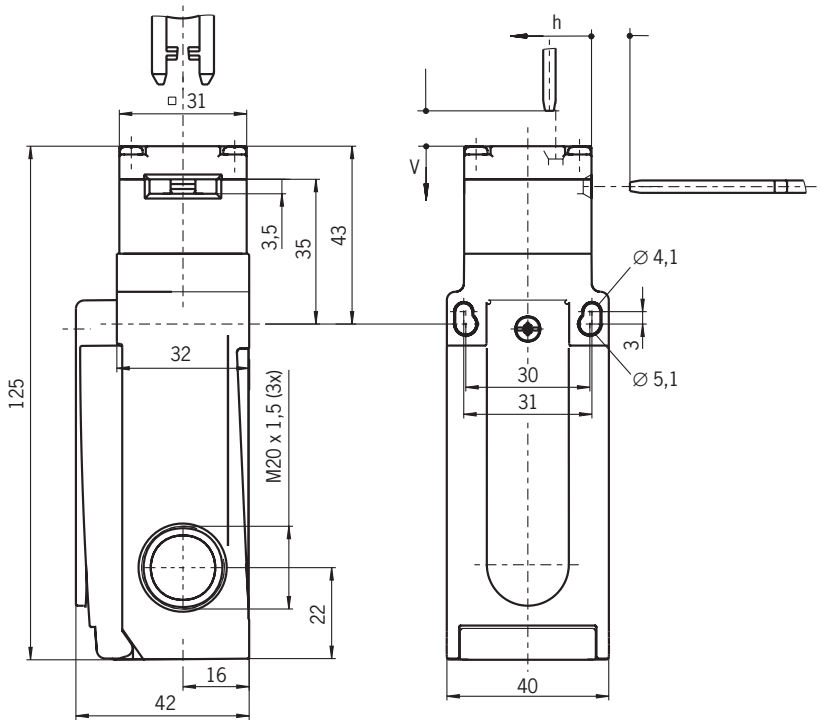
Ordering example: **NP1,** switching element **638**, increased overtravel side **A**, 40 mm hole spacing (**B**), cable entry **M**
NP1-638AB-M **Order No. 083 690**

Safety Switches GP...

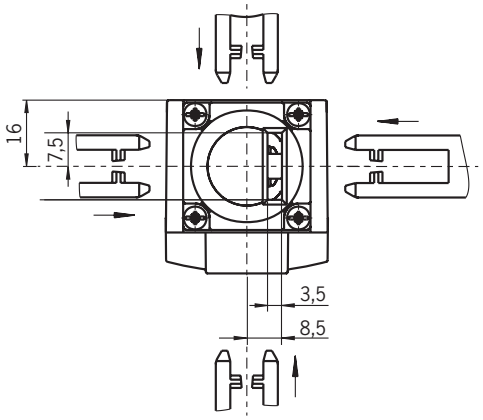
- **With 2 or 4 contact elements**
- **Cable entry M20x1.5**

* Approvals pending

Dimension drawing GP1...



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

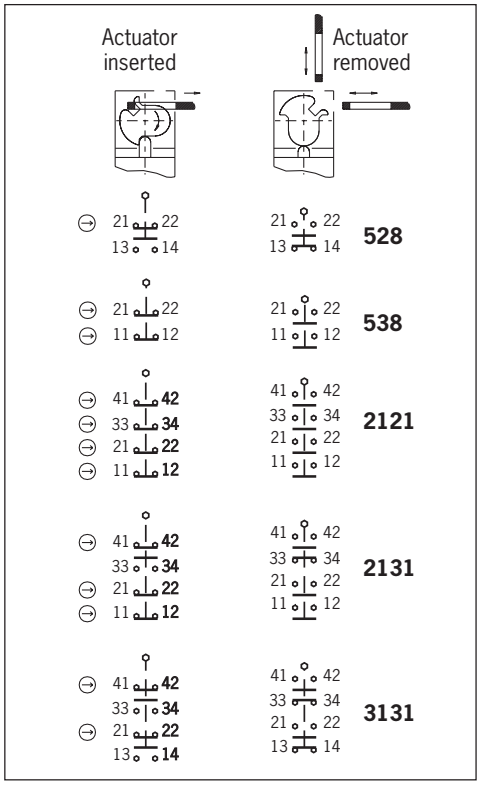


Assembly instructions

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 41) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

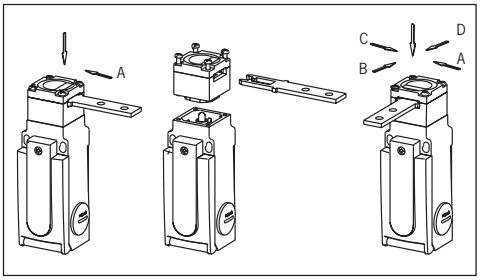
Switching elements

528	1 positively driven NC contact + 1 NO contact
538	2 positively driven NC contacts
2121	4 positively driven NC contacts
2131	3 positively driven NC contacts + 1 NO contact
3131	2 positively driven NC contacts + 2 NO contacts



Changing the approach direction

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



⚠ In the event of faults, the complete safety switch must be replaced.

Technical data

Parameters	Value					Unit
Housing material	Reinforced thermoplastic					
Degree of protection according to IEC 60529	IP 67					
Installation position	Any					
Mechanical life	2 x 10^6 operating cycles					
Ambient temperature	- 20 to + 80					°C
Approach speed, max.	20					m/min
Insertion/extraction force	8/25					N
Weight	Approx. 0.16					kg
Switching element	528	538	2121	2131	3131	
Contact elements	1 NC ⊖ + 1 NO	2 NC ⊖	4 NC ⊖	3 NC ⊖ + 1 NO	2 NC ⊖ + 2 NO	
Switching principle	Slow-action contact element					
Contact material	Silver alloy, gold flashed					
Rated impulse withstand voltage U_{imp}	2.5					kV
Rated insulation voltage U_i	250					V≅
Utilization category according to IEC 947-5-1	AC-15 I_e 4 A U_e 230 V / DC-13 I_e 4 A U_e 24 V					
Switching voltage, min. at 10 mA	12					V
Switching current, min. at 24 V	1					mA
Conventional thermal current I_{th}	4					A
Short circuit protection (control circuit fuse)	According to IEC 60269-1: 4 A gG					
Connection method GP...M	Screw terminal, M20x1.5					
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5					mm^2
Insertion depth (necessary minimum travel + permissible overtravel)	Standard actuators			Overtravel actuators		
Approach direction side (h)	28 + 2			28 + 7		mm
Approach direction from top (v)	29.5 + 1.5			29.5 + 7		mm

Ordering table

Series / Connection type	Switching element	Increased overtravel	Article	Contact elements	Order No.
GP1...M cable entry	**528**	**A** (side + top)	GP1-528A-M	1 positively driven NC contact + 1 NO contact	089 725
	538		GP1-538A-M	2 positively driven NC contacts	090 250
	2121		GP1-2121A-M	4 positively driven NC contacts	090 252
	2131		GP1-2131A-M	3 positively driven NC contacts + 1 NO contact	090 255
	3131		GP1-3131A-M	2 positively driven NC contacts + 2 NO contacts	090 258

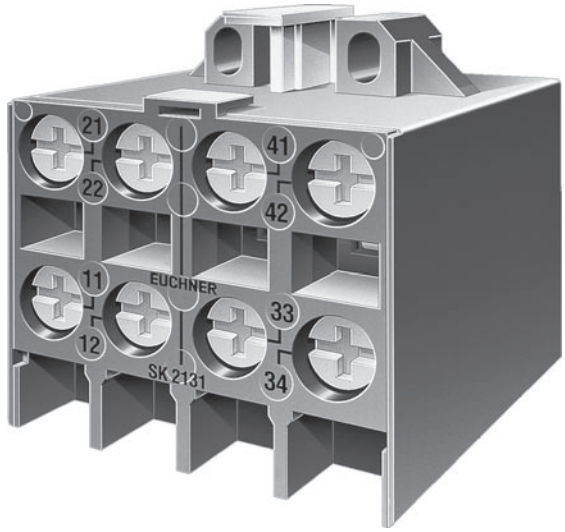
Safety switches TP... with guard-locking device

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 49).
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 31), 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 or Profisafe module.

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**

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 Safety at Work module
- Slide bolts available

Approach direction can be changed quickly

Operating principle

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

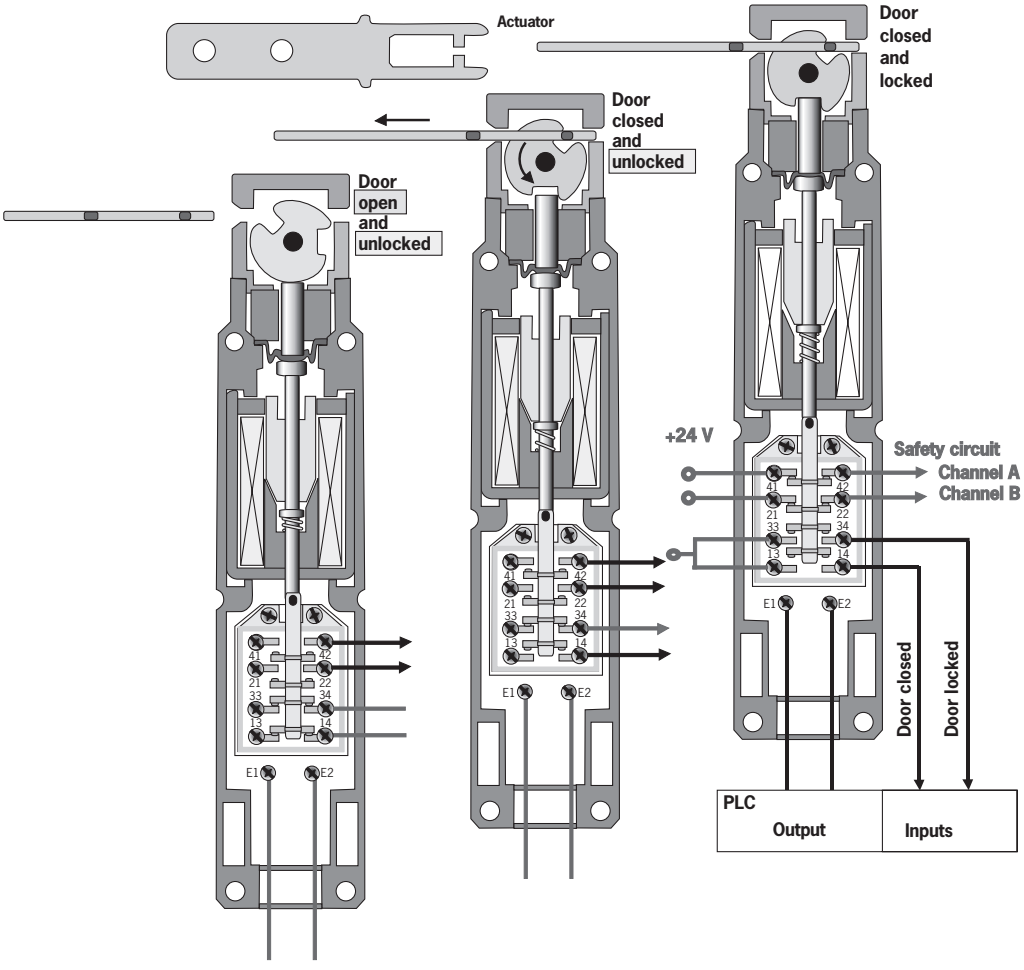
- Door closed and locked
- Door closed and unlocked
- Door open and unlocked

Door 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.

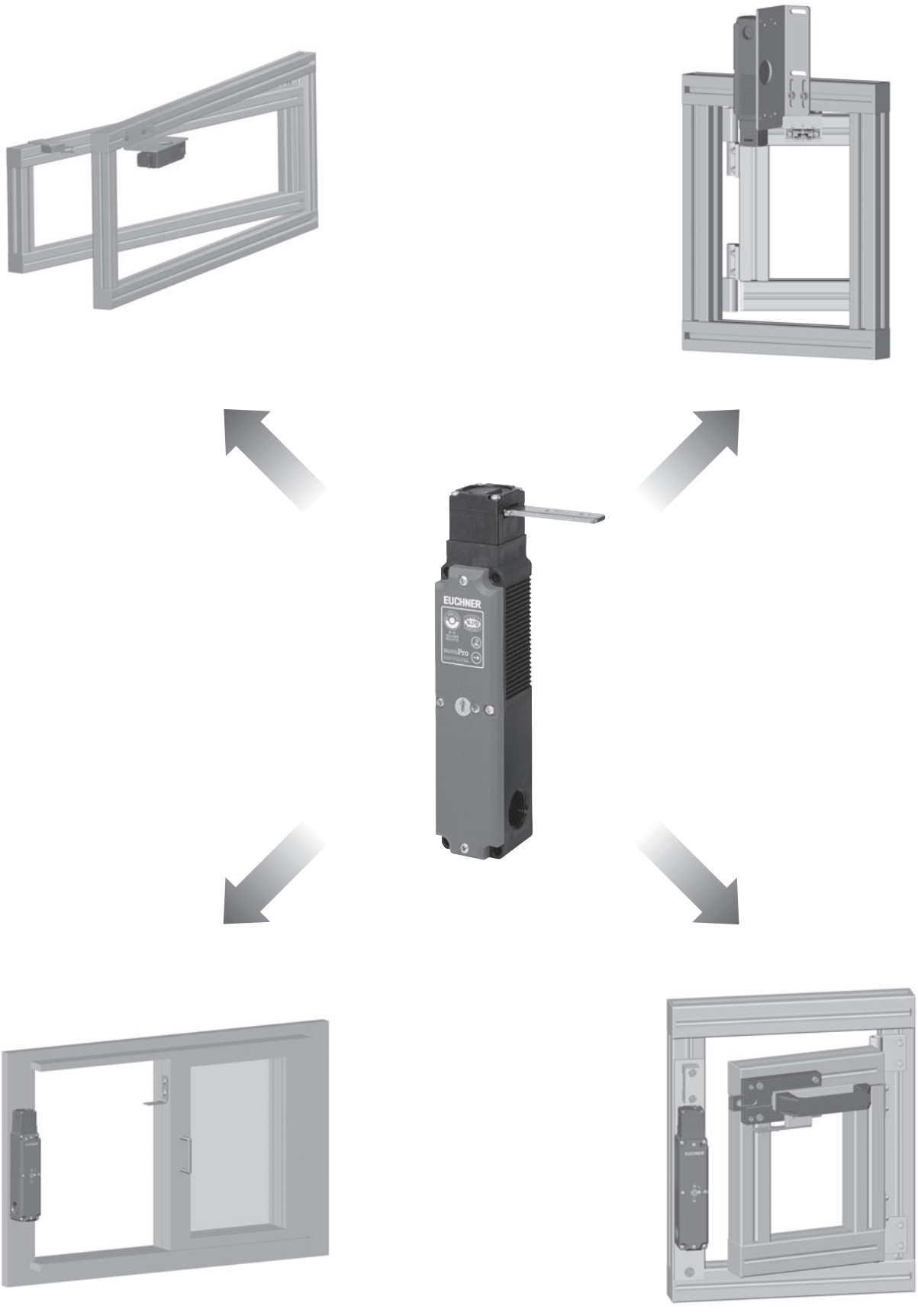
Door closed and unlocked
If the solenoid is switched on (in the case of safety switches TP...4131), the cam disc blocking is lifted and the NC contacts (21-22 and 41-42) are opened at the same time. NO contact 33-34 signals that the interlocking solenoid is unlocked.

Door 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 TP... series Safety Switches

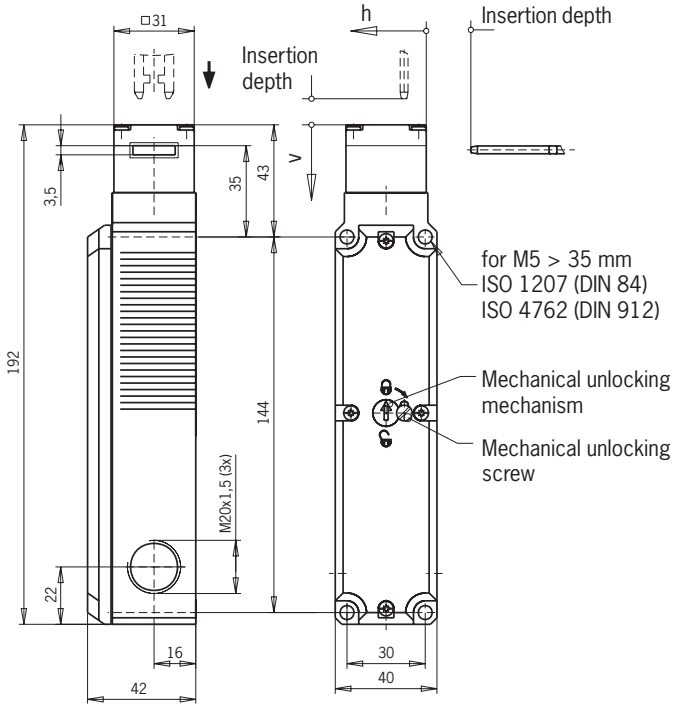


Safety switches TP...

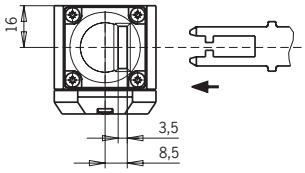
- **With 2 contact elements**
- **With door monitoring contact for TP3.../TP4...**
- **Cable entry M20x1.5 or**
  Plug connector SR6 (relevant plug connectors see page 45)

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

Dimension drawing TP...M

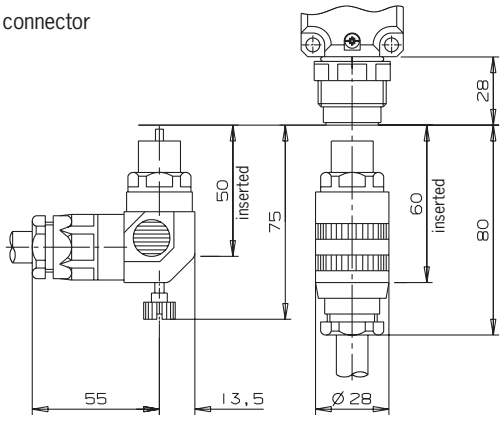


Please order actuator separately (see pages 38 to 40).



Dimension drawing TP...SR6

Please order plug connector separately (see page 45).



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 41) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

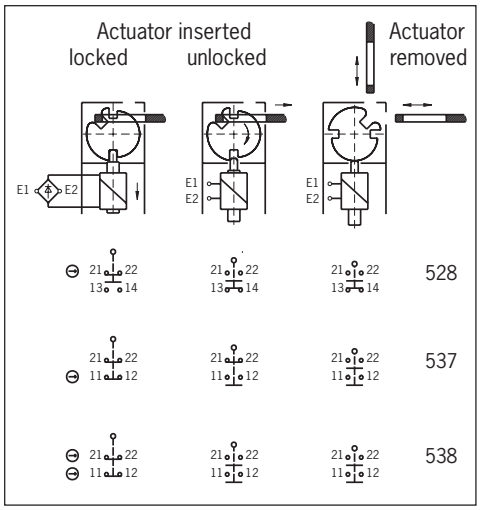
Switching elements

(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

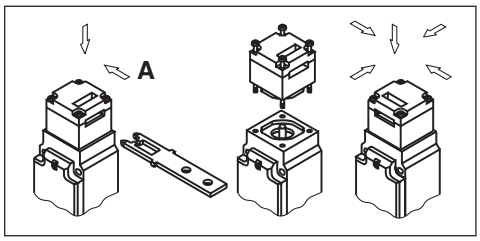
TP1.../ TP3...: Actuator inserted, mechanically locked, unlock by applying voltage.
TP2.../ TP4...: Lock by applying voltage.

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.



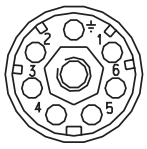
⚠ The complete safety switch must be replaced in the event of faults.

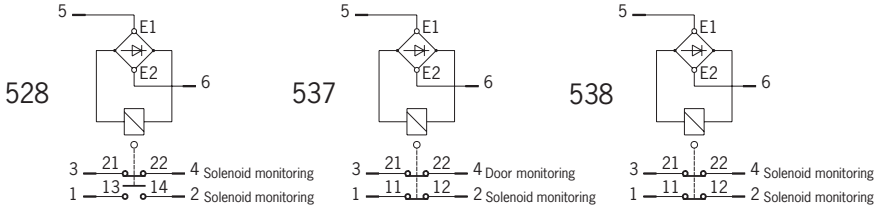
Technical data

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 10^6 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_{imp}	2.5			kV
Rated insulation voltage U_i	250			V≅
Utilization category to IEC 947-5-1	AC-15 I_e 6 A U_e 230 V / DC-13 I_e 6 A U_e 24 V			
Switching voltage min. at 10 mA	12			V
Switching current min. at 24 V	10			mA
Conventional thermal current I_{th}	6			A
Short circuit protection (control circuit fuse)	to IEC 60269-1: 6 A gG			
Connection method TP...M	Screw terminal, M20x1.5			
Connection method TP...SR6	Plug connector SR6			
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm^2			mm^2
Solenoid				
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
Insertion depth (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 TP...SR6

View of connection side





Ordering table

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

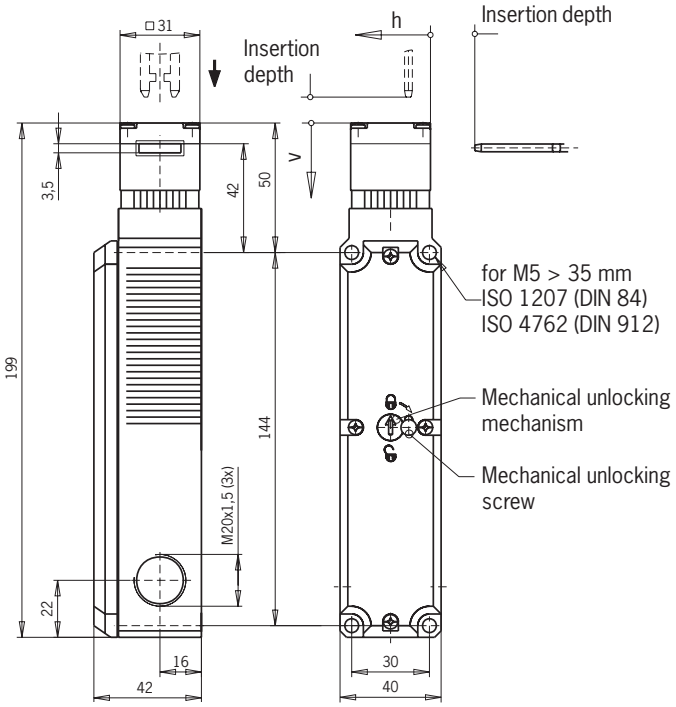
Ordering example: **TP2,** electr. locking, switching element **528**, increased overtravel side **A,** solenoid operating voltage **230** V AC, cable entry **M**
TP2-528 A 230 M **Order No. 084 332**

Safety switches TP..K..

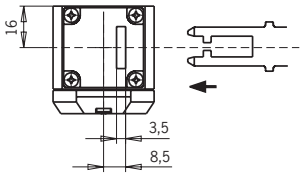
- **Increased overtravel with approach direction from top**
- **With 2 contact elements**
- **With door monitoring contact for TP3.../TP4...**
- **Cable entry M20x1.5 or**
  Plug connector SR6 (relevant plug connectors see page 45)

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

Dimension drawing TP...M

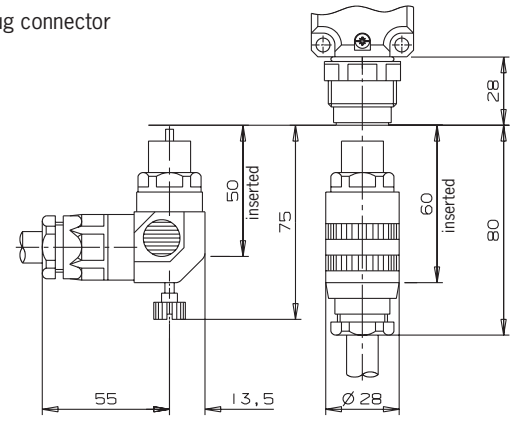


Please order actuator separately (see pages 38 to 40).



Dimension drawing TP...SR6

Please order plug connector separately (see page 45).



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 41) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

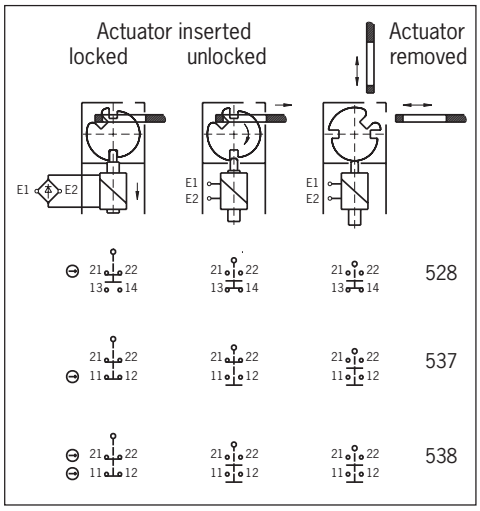
Switching elements

(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

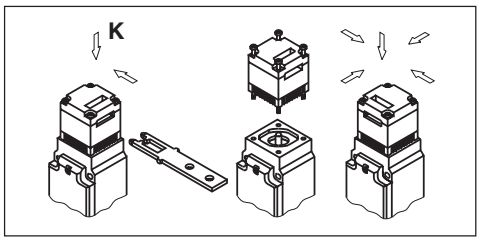
TP1.../ TP3...: Actuator inserted, mechanically locked, unlock by applying voltage.
TP2.../ TP4...: Lock by applying voltage.

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 an be changed to any 90° increment. The standard setting is approach direction K.



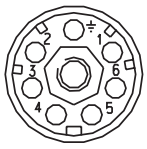
⚠ The complete safety switch must be replaced in the event of faults.

Technical data

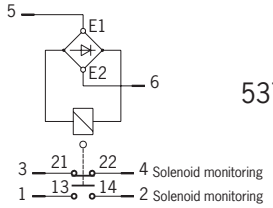
Parameters	Value			Unit
Housing material	Glass fiber reinforced thermoplastic			
Degree of protection to IEC 60529	TP...M: IP 67 / TP...SR6: IP 65			
Mounting position	optional			
Mechanical service life	1 x 10^6 switching cycles			
Ambient temperature	- 20 to + 55			°C
Approach speed, max.	20			m/min
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_{imp}	2.5			kV
Rated insulation voltage U_i	250			V≅
Utilization category to IEC 947-5-1	AC-15 I_e 6 A U_e 230 V / DC-13 I_e 6 A U_e 24 V			
Switching voltage min. at 10 mA	12			V
Switching current min. at 24 V	10			mA
Conventional thermal current I_{th}	6			A
Short circuit protection (control circuit fuse)	to IEC 60269-1: 6 A gG			
Connection method TP...M	Screw terminal, M20x1.5			
Connection method TP...SR6	Plug connector SR6			
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm^2			mm^2
Solenoid				
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
Insertion depth (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 TP...SR6

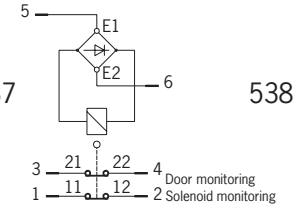
View of connection side



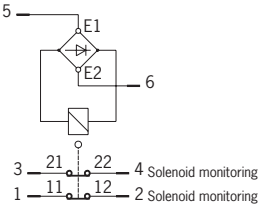
528



537



538



Ordering table

Series / Locking method / Connection type	Switching element	Increased over-travel	Article	Order No. Solenoid operating voltage 024	110	230
TP1-...M / TP3-...M	**528**		TP1-528K...M	084 342		
Mechanical locking,	**537**		TP3-537K...M	084 347		
Cable entry	**538**	**K**	TP1-538K...M	084 343	on request	
TP2-...M / TP4-...M	**528**	(side + top)	TP2-528K...M	084 344		on request
Electrical locking,	**537**		TP4-537K...M	084 348	084 349	
Cable entry	**538**		TP2-538K...M	084 346	on request	
TP1-...SR6 / TP3-...SR6	**528**		TP1-528K...SR6	088 210		
Mechanical locking,	**537**		TP3-537K...SR6	088 213		
Plug connector SR6	**538**	**K**	TP1-538K...SR6	088 212	on request	on request
TP2-...SR6 / TP4-...SR6	**528**	(side + top)	TP2-528K...SR6	088 214		
Electrical locking,	**537**		TP4-537K...SR6	088 216		
Plug connector SR6	**538**		TP2-538K...SR6	088 215		

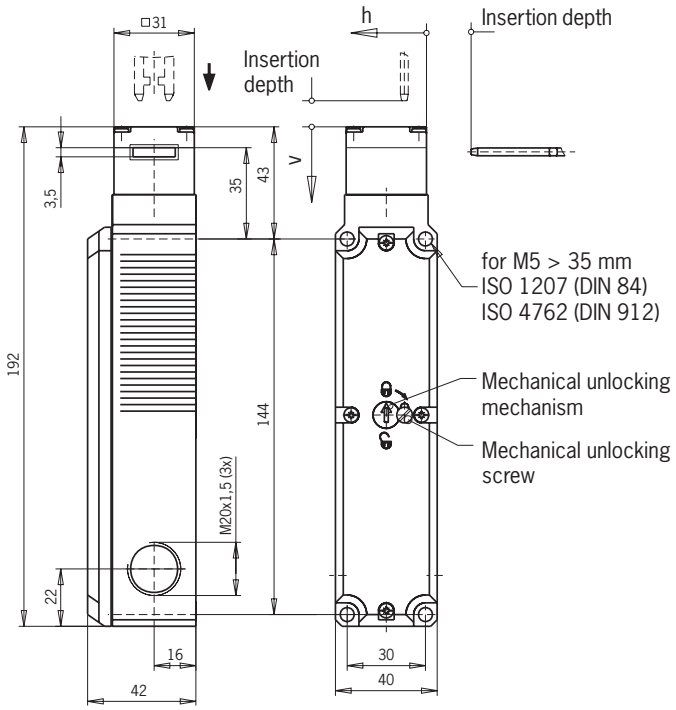
Ordering example: **TP2,** electr. locking, switching element **528**, increased overtravel side and top **K,** solenoid operating voltage **24** V AC/DC, cable entry **M**
TP2-528 K 024 M **Order No. 084 344**

Safety switches TP...

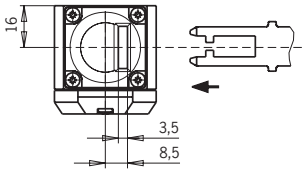
- **With 4 contact elements, without door monitoring contact**
- **Cable entry M20x1.5 or**
  Plug connector SR11 (relevant plug connectors see page 45)

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

Dimension drawing TP...M

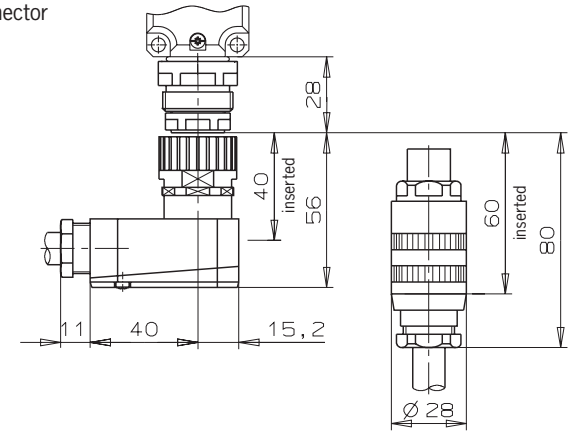


Please order actuator separately (see pages 38 to 40).



Dimension drawing TP...SR11

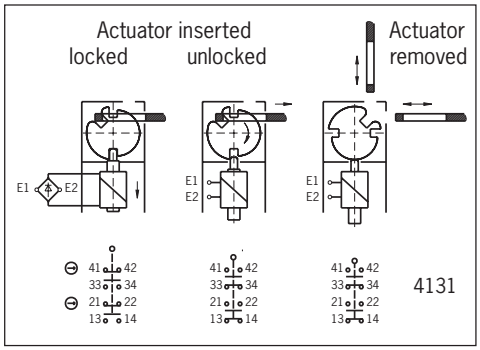
Please order plug connector separately (see page 45).



Switching elements

(dependent action contact element)

4131 2 positively driven NC contacts +2 NO contacts



Locking methods

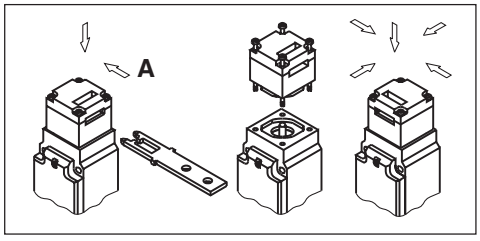
TP1...: Actuator inserted, mechanically locked, unlock by applying voltage.
TP2...: Lock by applying voltage.

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.

Installation notes

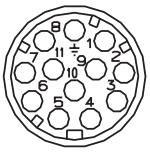
The safety switch and actuator must be installed properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 41) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

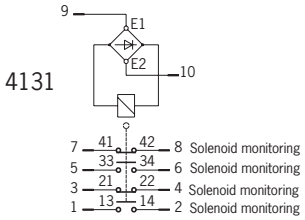
Technical data

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 10^6 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 ⊖ + 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≅
Utilization category to IEC 947-5-1	TP...M: AC-15 I_e 6 A U_e 230 V / DC-13 I_e 6 A U_e 24 V TP...SR11: AC-15 I_e 4 A U_e 50 V / DC-13 I_e 4 A U_e 24 V		
Switching voltage min. at 10 mA	12		V
Switching current min. at 24 V	10		mA
Conventional thermal current I_{th}	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 TP...M	Screw terminal, M20x1.5		
Connection method TP...SR11	Plug connector SR11		
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm²		mm²
Solenoid			
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
Insertion depth (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 TP...SR11

View of connection side





Ordering table

Series / Locking method / Connection type	Switching element	Increased over-travel	Article	Order No. Solenoid operating voltage 024	110	230
TP1-...M Mechanical locking, Cable entry	**4131**	**A** (side)	TP1-4131A...M	084 115	084 116	084 117
				–	–	–
TP2-...M Electrical locking, Cable entry			TP2-4131A...M	084 125	084 126	084 128
				–	–	–
TP1-...SR11 Mechanical locking, Plug connector SR11	**4131**	**A** (side)	TP1-4131A...SR11	088 202	–	–
				–		
TP2-...SR11 Electrical locking, Plug connector SR11			TP2-4131A...SR11	088 203	–	–
				–		

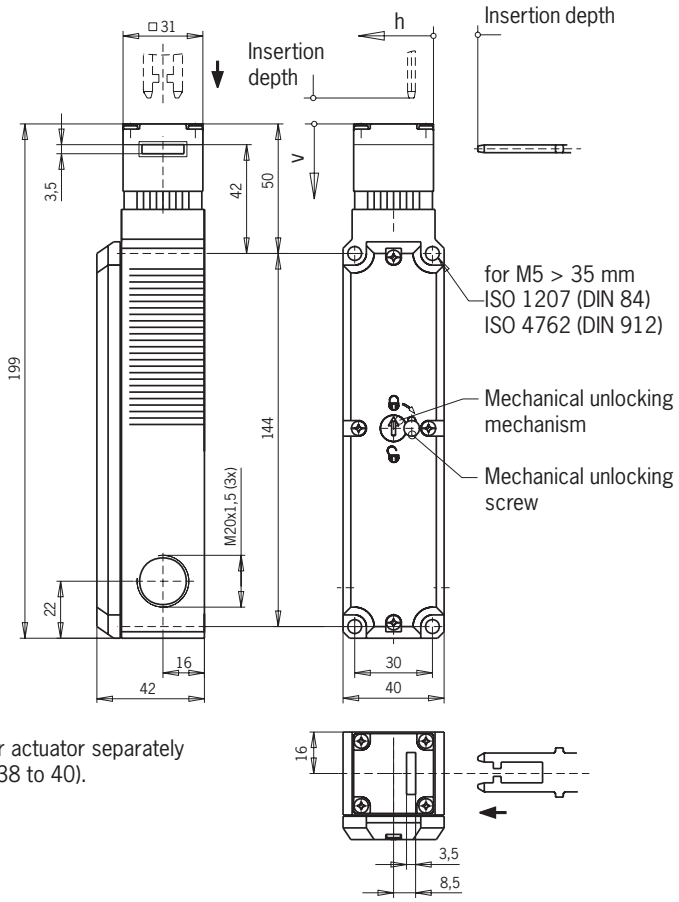
Ordering example: **TP2,** electr. locking, switching element **4131**, increased overtravel side **A,** solenoid operating voltage **024** V AC/DC, cable entry **M**
TP2-4131 A 024 M **Order No. 084 125**

Safety switches 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 45)

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

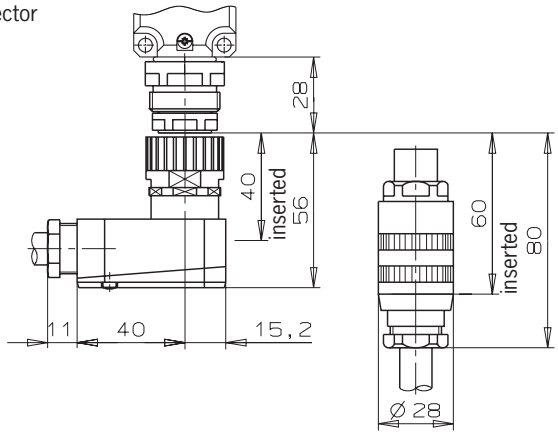
Dimension drawing TP...M



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

Dimension drawing TP...SR11

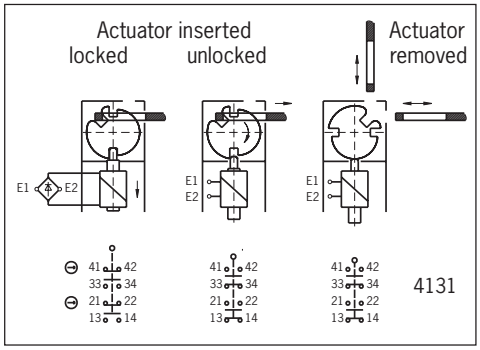
Please order plug connector separately (see page 45).



Switching elements

(dependent action contact element)

4131 2 positively driven NC contacts +2 NO contacts



Locking methods

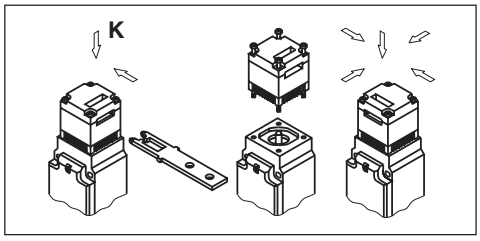
TP1...: Actuator inserted, mechanically locked, unlock by applying voltage.
TP2...: Lock by applying voltage.

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.

Installation notes

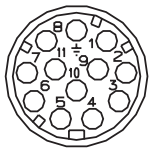
The safety switch and actuator must be installed properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 41) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

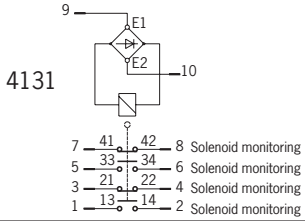
Technical data

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 10^6 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 ⊖ + 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≅
Utilization category to IEC 947-5-1	TP...M: AC-15 I_e 6 A U_e 230 V / DC-13 I_e 6 A U_e 24 V TP...SR11: AC-15 I_e 4 A U_e 50 V / DC-13 I_e 4 A U_e 24 V		
Switching voltage min. at 10 mA	12		V
Switching current min. at 24 V	10		mA
Conventional thermal current I_{th}	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 TP...M	Screw terminal, M20x1.5		
Connection method TP...SR11	Plug connector SR11		
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm²		mm²
Solenoid			
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
Insertion depth (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 TP...SR11

View of connection side





Ordering table

Series / Locking method / Connection type	Switching element	Increased over-travel	Article	Order No. Solenoid operating voltage 024	110	230
TP1-...M Mechanical locking, Cable entry	**4131**	**K** (side + top)	TP1-4131K...M	084 150	084 254	084 255
				–	–	–
TP2-...M Electrical locking, Cable entry			TP2-4131K...M	084 253	on request	on request
				–	–	–
TP1-...SR11 Mechanical locking, Plug connector SR11	**4131**	**K** (side + top)	TP1-4131K...SR11	088 217	–	–
				–		
TP2-...SR11 Electrical locking, Plug connector SR11			TP2-4131K...SR11	088 218	–	–
				–		

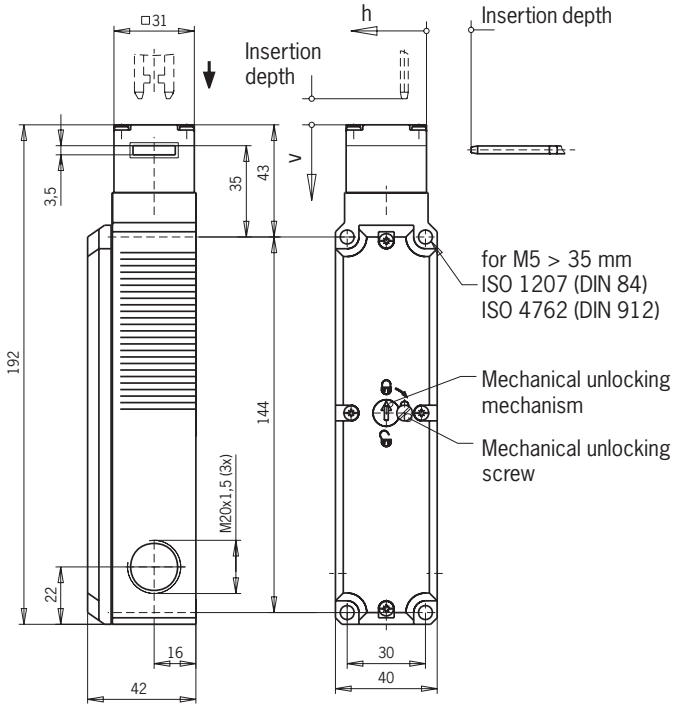
Ordering example: **TP2,** electr. locking, switching element **4131**, increased overtravel side and top **K,** solenoid operating voltage **024** V AC/DC, cable entry **M**
TP2-4131 K 024 M **Order No. 084 253**

Safety switches TP...

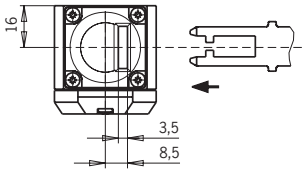
- **With 4 contact elements**
- **With door monitoring contact**
- **Cable entry M20x1.5 or**
  Plug connector SR11 (relevant plug connectors see page 45)

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

Dimension drawing TP...M

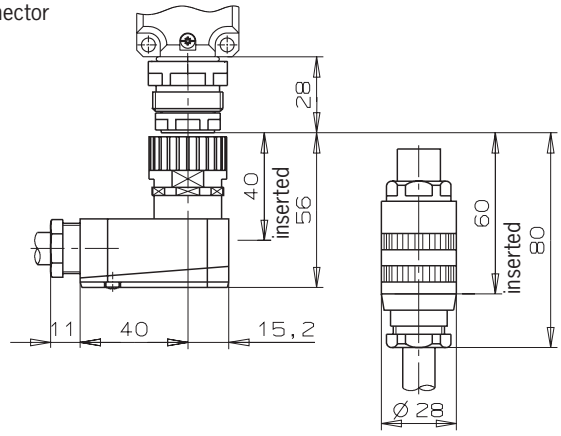


Please order actuator separately (see pages 38 to 40).



Dimension drawing TP...SR11

Please order plug connector separately (see page 45).



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 41) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

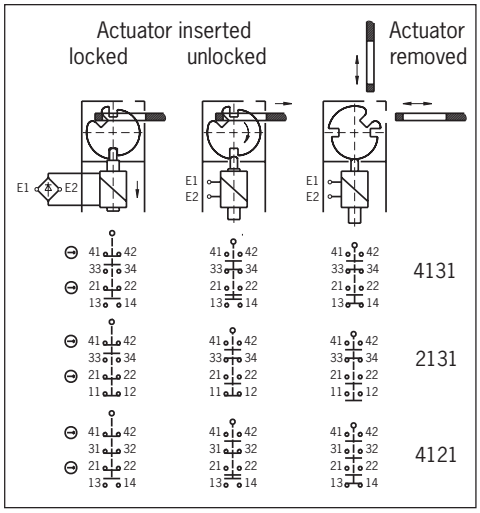
Switching elements

(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

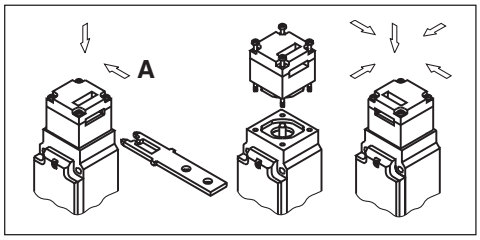
TP3...: Actuator inserted, mechanically locked, unlock by applying voltage.
TP4...: Lock by applying voltage.

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.



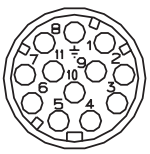
⚠ The complete safety switch must be replaced in the event of faults.

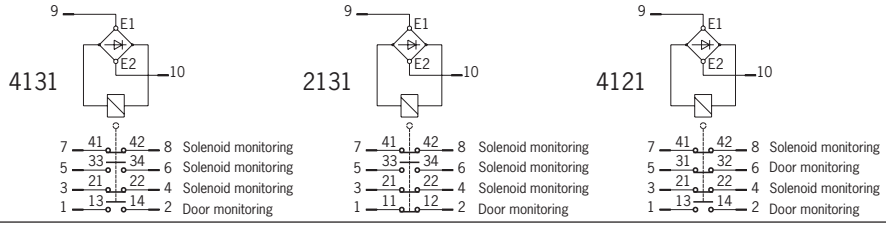
Technical data

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 10^6 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	2 NC ⊖ + 1 NO + 1 NO	2 NC ⊖ + 1 NO + 1 NC	2 NC ⊖ + 1 NC + 1 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≅
Utilization category to IEC 947-5-1	TP...M: AC-15 I_e 6 A U_e 230 V / DC-13 I_e 6 A U_e 24 V TP...SR11: AC-15 I_e 4 A U_e 50 V / DC-13 I_e 4 A U_e 24 V			
Switching voltage min. at 10 mA	12			V
Switching current min. at 24 V	10			mA
Conventional thermal current I_{th}	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 TP...M	Screw terminal, M20x1.5			
Connection method TP...SR11	Plug connector SR11			
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm²			mm²
Solenoid				
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
Insertion depth (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 TP...SR11

View of connection side





Ordering table

Series / Locking method / Connection type	Switching element	Increased over-travel	Article	Order No. Solenoid operating voltage 024	110	230
TP3-...M	**4131**		TP3-4131A...M	084 129	084 130	084 131
Mechanical locking,	**2131**		TP3-231A...M	084 142	084 143	084 144
Cable entry	**4121**	**A**	TP3-4121A...M	084 135	084 137	084 138
TP4-...M	**4131**	(side)	TP4-4131A...M	084 132	084 133	084 134
Electrical locking,	**2131**		TP4-2131A...M	084 145	084 147	084 148
Cable entry	**4121**		TP4-4121A...M	084 139	084 140	084 141
TP3-...SR11	**4131**		TP3-4131A...SR11	088 204		
Mechanical locking,	**2131**		TP3-2131A...SR11	088 205	–	–
Plug connector SR11	**4121**	**A**	TP3-4121A...SR11	088 206		
TP4-...SR11	**4131**	(side)	TP4-4131A...SR11	088 207		
Electrical locking,	**2131**		TP4-2131A...SR11	088 208	–	–
Plug connector SR11	**4121**		TP4-4121A...SR11	088 209		

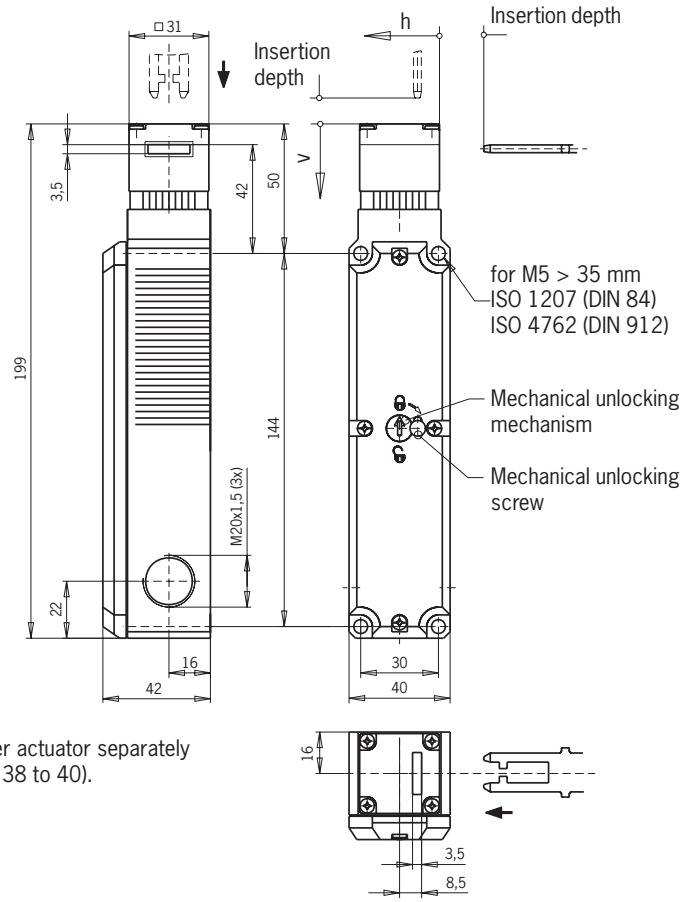
Ordering example: **TP4,** electr. locking, switching element **4131**, increased overtravel side **A,** solenoid operating voltage **024** V AC/DC, cable entry **M**
TP4-4131 A 024 M **Order No. 084 132**

Safety switches 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 45)

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

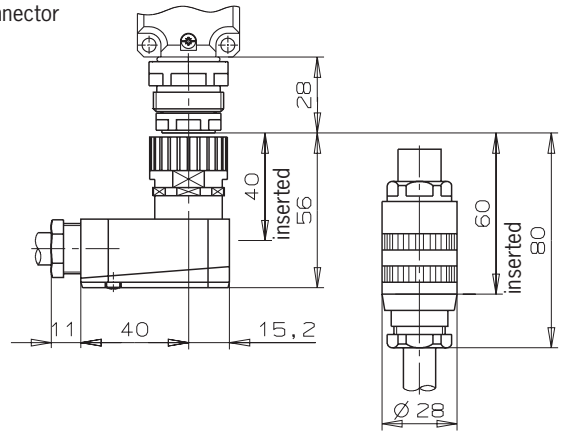
Dimension drawing TP...M



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

Dimension drawing TP...SR11

Please order plug connector separately (see page 45).



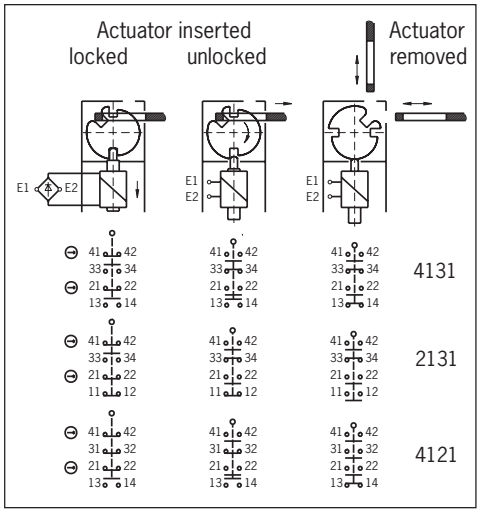
Switching elements

(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

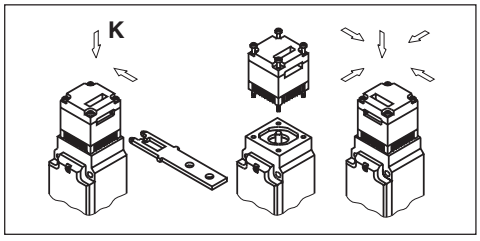
TP3...: Actuator inserted, mechanically locked, unlock by applying voltage.
TP4...: Lock by applying voltage.

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.

Installation notes

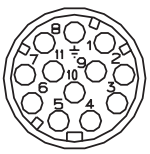
The safety switch and actuator must be installed properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 41) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

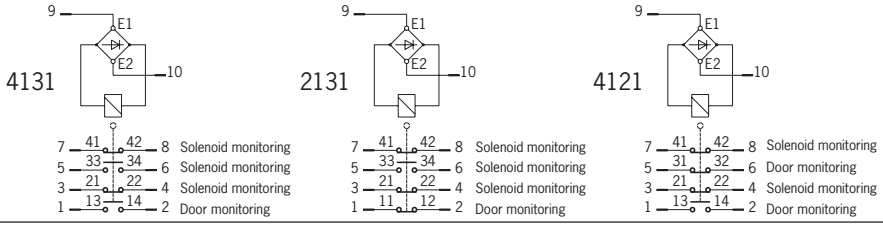
Technical data

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 10^6 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	2 NC ⊖ + 1 NO + 1 NO	2 NC ⊖ + 1 NO + 1 NC	2 NC ⊖ + 1 NC + 1 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≅
Utilization category to IEC 947-5-1	TP...M: AC-15 I_e 6 A U_e 230 V / DC-13 I_e 6 A U_e 24 V TP...SR11: AC-15 I_e 4 A U_e 50 V / DC-13 I_e 4 A U_e 24 V			
Switching voltage min. at 10 mA	12			V
Switching current min. at 24 V	10			mA
Conventional thermal current I_{th}	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 TP...M	Screw terminal, M20x1.5			
Connection method TP...SR11	Plug connector SR11			
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm²			mm²
Solenoid				
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
Insertion depth (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 TP...SR11

View of connection side





Ordering table

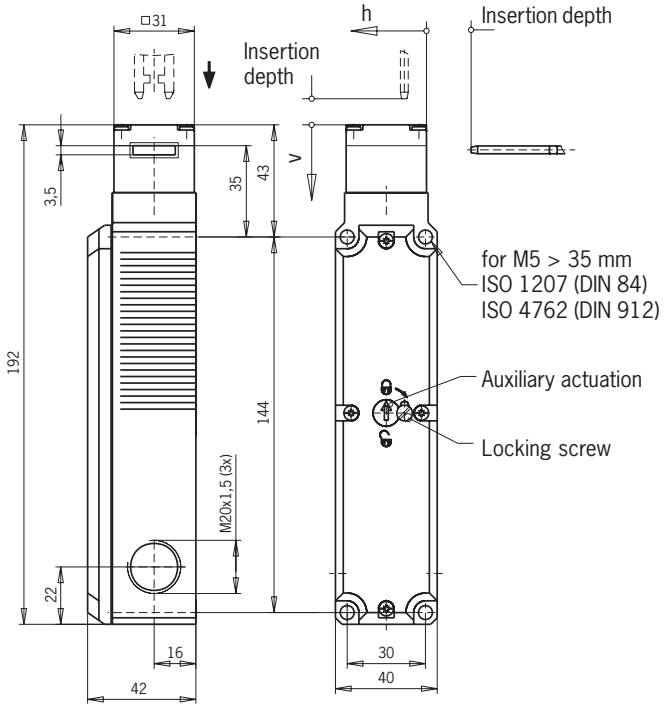
Series / Locking method / Connection type	Switching element	Increased over-travel	Article	Order No. Solenoid operating voltage 024	110	230
TP3-...M	**4131**		TP3-4131K...M	084 256	084 257	084 258
Mechanical locking,	**2131**		TP3-2131K...M	084 264		084 265
Cable entry	**4121**	**K**	TP3-4121K...M	084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

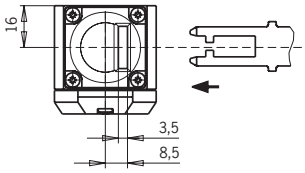
Safety switches TP...

- **With door unlock request contact**
- **With 3 contact elements**
- **Cable entry M20x1.5 or**
  Plug connector SR11 (relevant plug connectors see page 45)

Dimension drawing TP...M

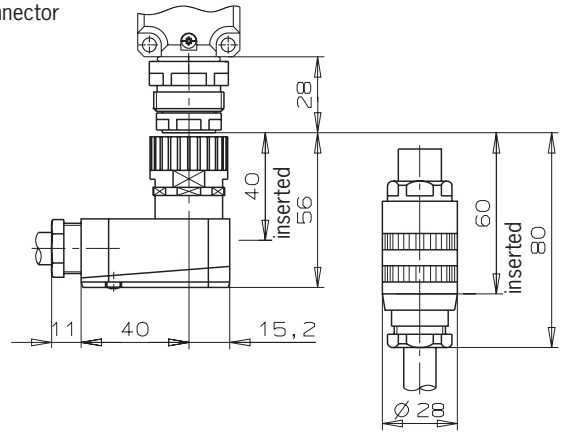


Please order actuator separately (see pages 38 to 40).



Dimension drawing TP...SR11

Please order plug connector separately (see page 45).



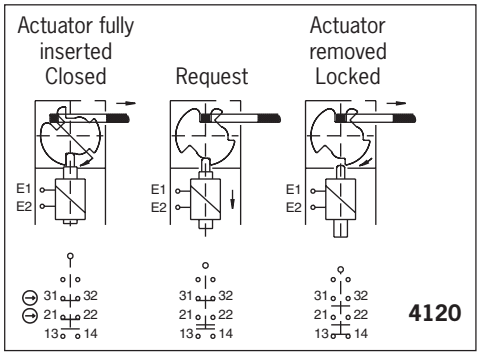
Installation notes

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 41) 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

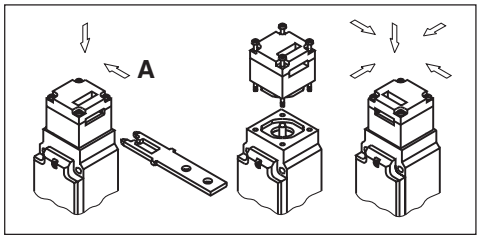
The unlock request contact 21-22 is operated if the door together with the actuator is moved slightly away from its closed position. This action opens the 21-22 contact, which can then be used via the PLC to unlock the solenoid. The door can then be opened in the normal way. This procedure ensures that 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.



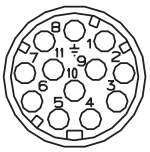
⚠ The complete safety switch must be replaced in the event of faults.

Technical data

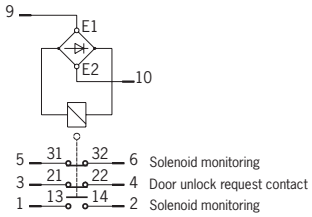
Parameter	Value		Unit
Housing material	Glass fiber reinforced thermoplastic		
Degree of protection to IEC 60529	TP...M: IP 67 / TP...SR11: IP 65		
Mounting position	optional		
Mechanical service life	5 x 10^5 switching cycles		
Ambient temperature	- 20 to + 55		°C
Approach speed, max.	20		m/min
Insertion/extraction 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_{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≅
Utilization category to IEC 947-5-1	TP...M: AC-15 I_e 6 A U_e 230 V / DC-13 I_e 6 A U_e 24 V TP...SR11: AC-15 I_e 4 A U_e 50 V / DC-13 I_e 4 A U_e 24 V		
Switching voltage min. at 10 mA	12		V
Switching current min. at 24 V	10		mA
Conventional thermal current I_{th}	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 TP...M	Screw terminal, M20x1.5		
Connection method TP...SR11	Plug connector SR11		
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm²		mm²
Solenoid			
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
Insertion depth (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 TP...SR11

View of connection side



4120



Ordering table

Series / Locking method / Connection type	Switching element	Increased over-travel	Article	Order No. Solenoid operating voltage 024	110	230
TP5-...M Mechanical locking, Cable entry	**4120**	**A** (side)	TP5-4120A...M	084 279	on request	on request
TP6-...M Electrical locking, Cable entry			TP6-4120A...M	084 280		
TP5-...SR11 Mechanical locking, Plug connector SR11	**4120**	**A** (side)	TP5-4120A...SR11	on request	on request	on request
TP6-...SR11 Electrical locking, Plug connector SR11			TP6-4120A...SR11			

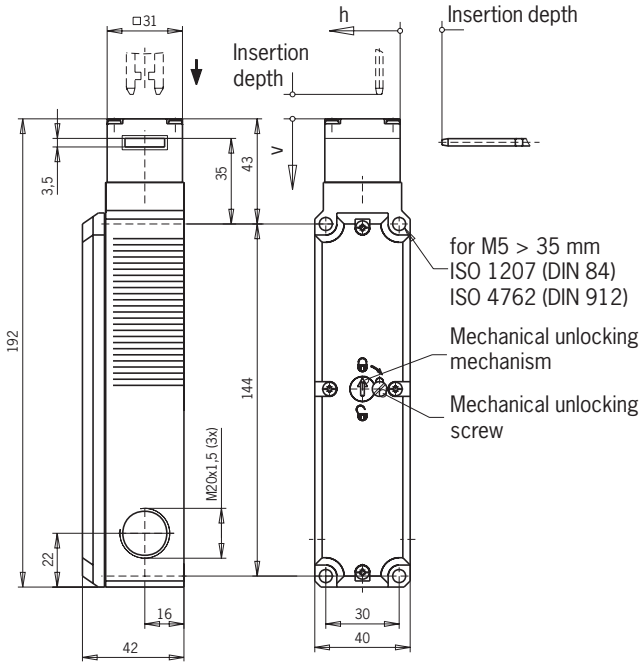
Ordering example: **TP6,** electr. locking, switching element **4120**, increased overtravel side **A,** solenoid operating voltage **024** V AC/DC, cable entry **M**
TP6-4120 A 024 M **Order No. 084 280**

Safety switches TP...

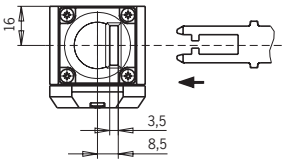
- **With 4 positively driven NC contacts**
- **With door monitoring contact**
- **Cable entry M20x1.5**

* Approvals pending

Dimension drawing TP...M

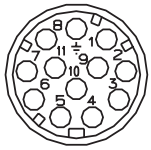


Please order actuator separately (see pages 38 to 40).

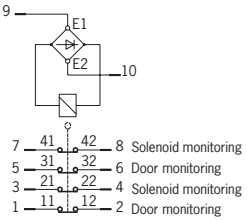


Pin assignment TP...SR11

View of connection side



4141



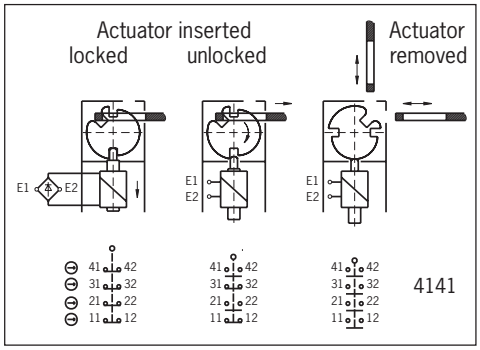
Technical data

As for standard version (see pages 16 - 28).

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).

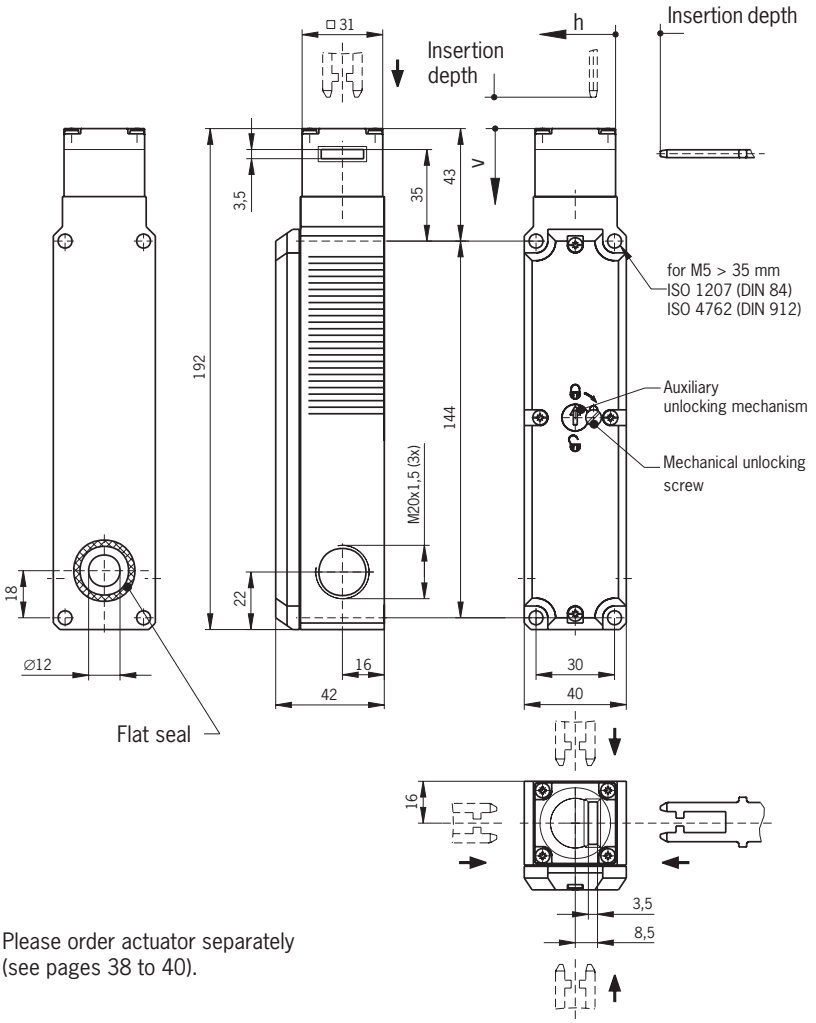
Ordering table

Series / Locking method / Connection type	Switching element	Increased over-travel	Article	Order No. Solenoid operating voltage 024
TP3-...M Mechanical locking, Cable entry	**4141**	**A** (seitlich)	TP3-4141A024M	084 270
TP4-...M Electrical locking, Cable entry			TP4-4141A024M	084 275
TP3-...SR11 Mechanical locking, Plug connector SR11			TP3-4141A024SR11	088 922
TP4-...SR11 Electrical locking, Plug connector SR11			TP4-4141A024SR11	088 923

Safety switches TP...

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

Dimension drawing TP...M C1761



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

Technical data

As for standard version (see pages 16 - 28).

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.

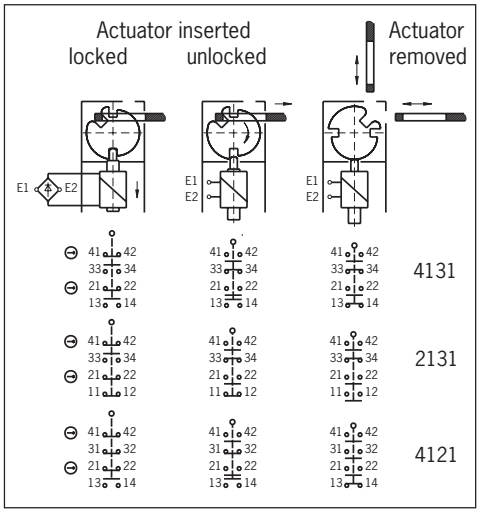
Switching elements

(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)

Series / Locking method / Connection type	Switching element	Increased over-travel	Article	Order No. Solenoid operating voltage 024
TP3-...M Mechanical locking, Cable entry	**2131**	**A** (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**
TP3-2131 A 024 M C1761 **Order No. 084 290**

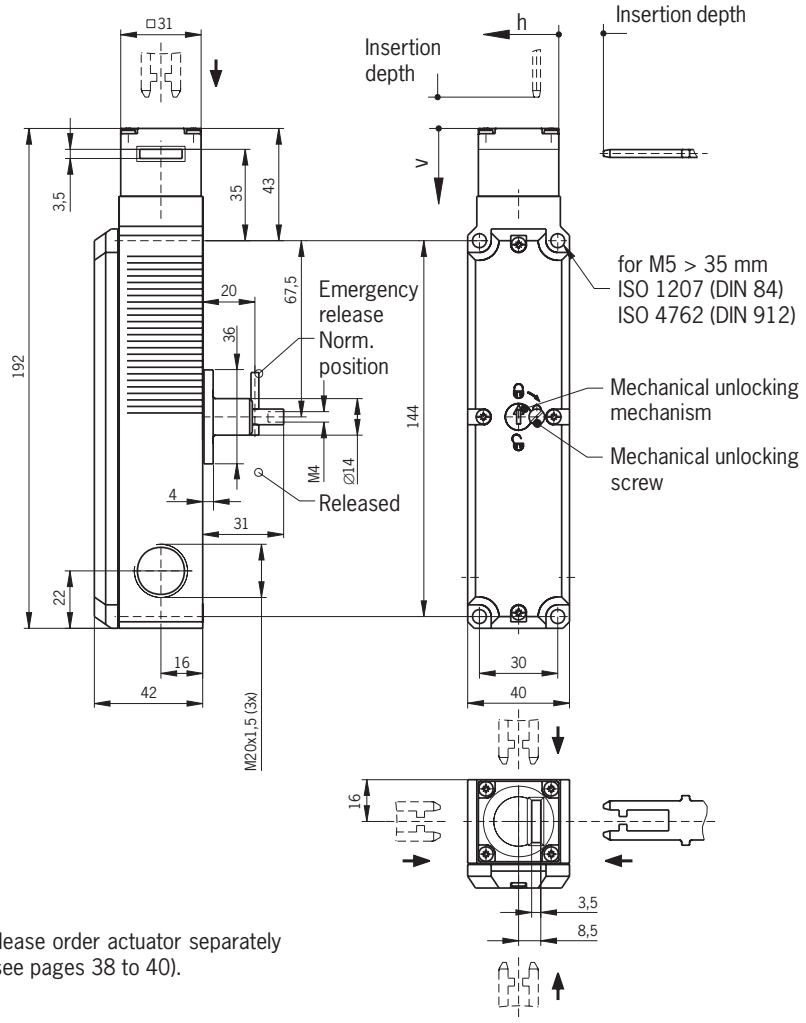
Safety switches TP...

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

BG*

* Approval with switching element 4141 pending

Dimension drawing TP...M C1743



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

Technical data

As for standard version (see pages 16 - 28).

Deviation from standard

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

Switching elements

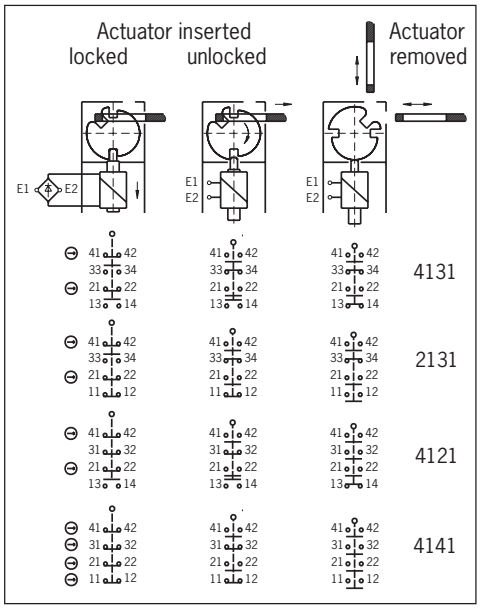
(dependent action contact element)

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

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.

Ordering table (further types available on request)

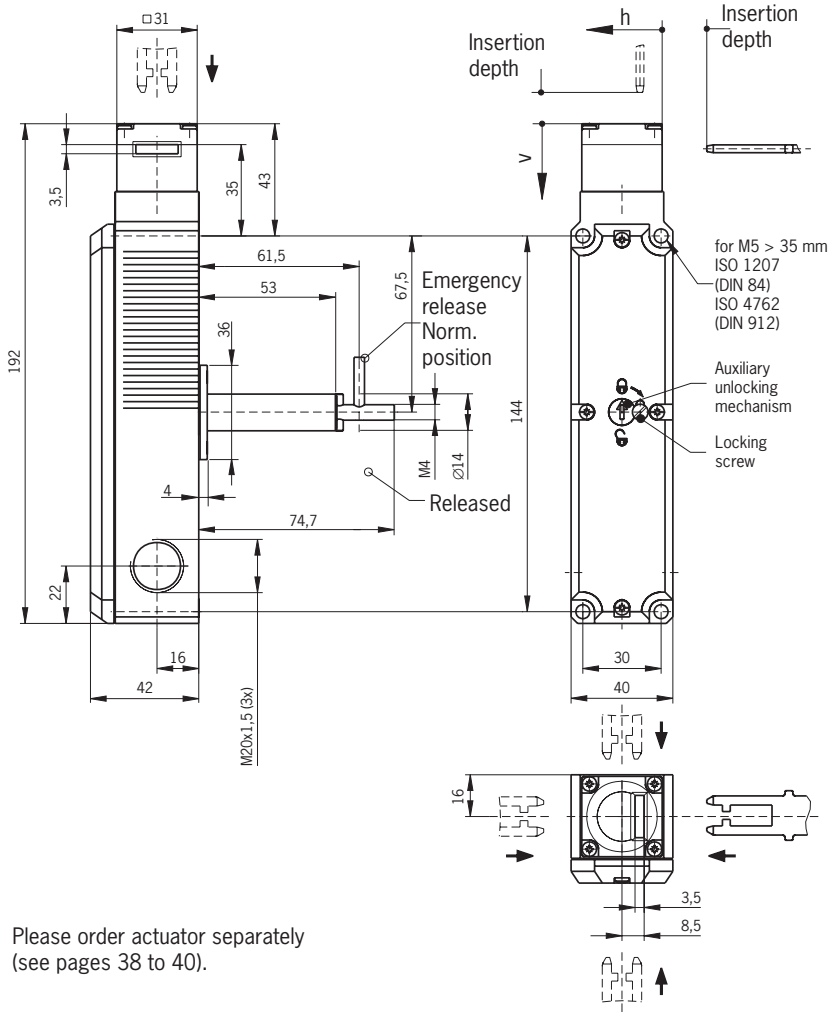
Series / Locking method / Connection type	Switching element	Increased over-travel	Article	Order No. Solenoid operating voltage 024
TP3-...M Mechanical locking, Cable entry	**2131**	**A** (side)	TP3-2131A024M C1743	084 285
	4121		TP3-4121A024M C1743	087 427
	4141		TP3-4141A024M C1743	086 165

Ordering example: **TP3,** Mech. locking, switching element **2131**, increased overtravel side **A,** solenoid operating voltage **024** V AC/DC, cable entry **M**
TP3-2131 A 024 M C1743 **Cat no. 084 285**

Safety switches 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 TP...M C1993



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

Technical data

As for standard version (see pages 16 - 28).

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 49).

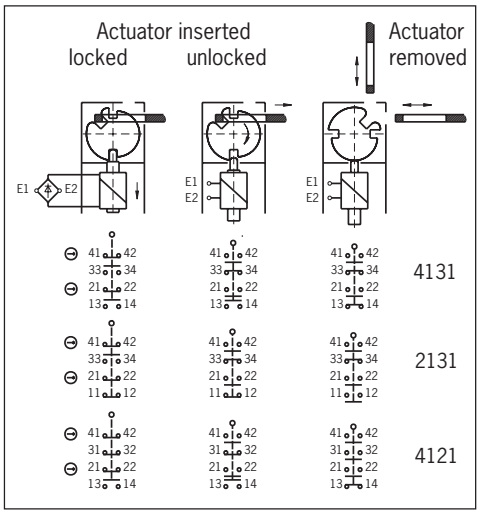
Switching elements

(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)

Series / Locking method / Connection type	Switching element	Increased over-travel	Article	Order No. Solenoid operating voltage 024
TP3-...M Mechanical locking, Cable entry	**2131**	**A** (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**
TP3-2131 A 024 M C1993 **Cat no. 087 400**

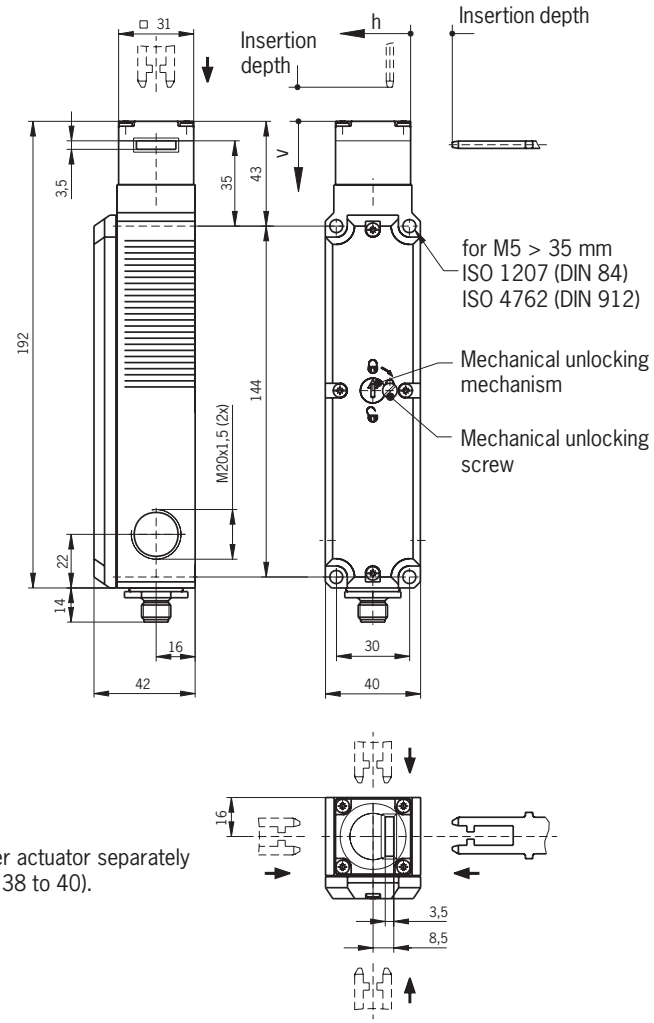
Safety switches TP...

- **With 3 positively driven NC contacts** (fed out through M12 plug connector)
- **With door monitoring contact**
- **M12 plug connector** (relevant plug connectors see page 44)

BG*

* Approval pending

Dimension drawing TP...M C1992



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

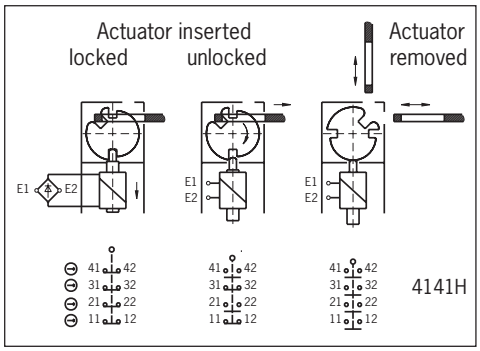
Deviation from standard

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



Locking methods

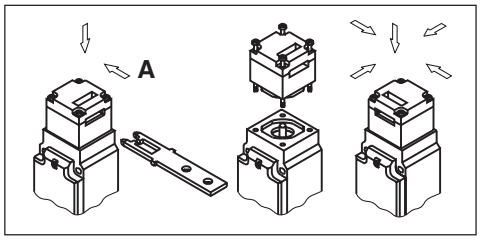
TP3...: Actuator inserted, mechanically locked, unlock by applying voltage.
TP4...: Lock by applying voltage.

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.

Installation notes

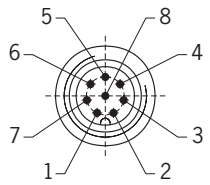
The safety switch and actuator must be assembled properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 41) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

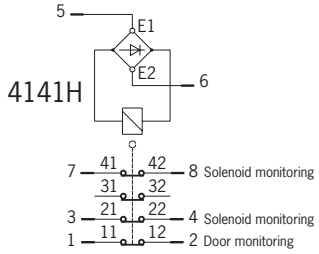
Technical data

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 10^6 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_{imp}	1,5		kV
Rated insulation voltage U_i	30		V≅
Utilization category to IEC 947-5-1	AC-15 I_e 1 A U_e 24 V / DC-13 I_e 1 A U_e 24 V		
Switching voltage min. at 10 mA	12		V
Switching current min. at 24 V	1		mA
Conventional thermal current I_{th}	1		A
Short circuit protection (control circuit fuse)	to IEC 60269-1: 1 A gG		
Connection method	M12 plug connector		
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm^2		mm^2
Solenoid			
Connection	reverse polarity protected, integrated bridge rectifier		
Solenoid operating voltage	24 V AC/DC (all -15% / +10%)		
Duty cycle	100		%
Power consumption	8		W
Insertion depth (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 TP...C1992

View of connection side





Ordering table (further types available on request)

Series / Locking method / Connection type	Switching element	Increased over-travel	Article	Order No. Solenoid operating voltage 024
TP3-...M Mechanical locking, M12 plug connector	**4141H**	**A** (side)	TP3-4141HA024SM8 C1992	087 377
TP4-...M Electrical locking, M12 plug connector			TP4-4141HA024SM8 C1992	087 378

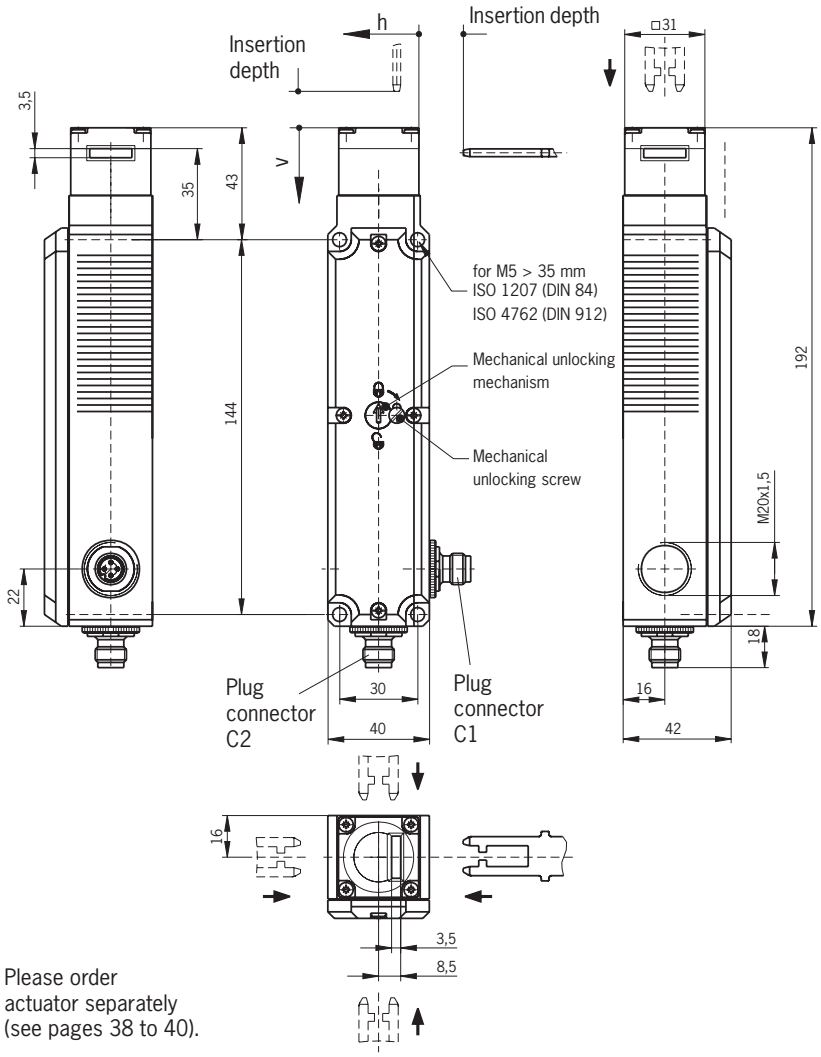
Ordering example: **TP3,** Mech. locking, switching element **4141H**, increased overtravel side **A,** solenoid operating voltage **024** V AC/DC, M12 plug connector
TP3-4141H A 024 SM8 C1992 **Order No. 087 377**

Safety switches 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 TP...M C2013

(M12 plug connector right)



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

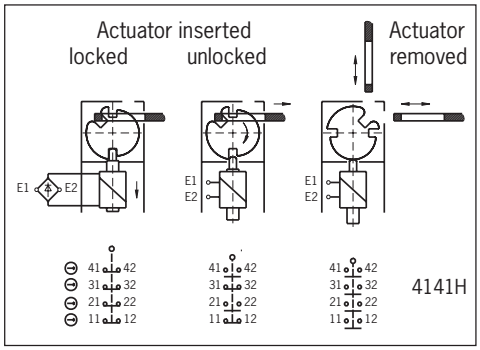
Deviation from standard

- 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

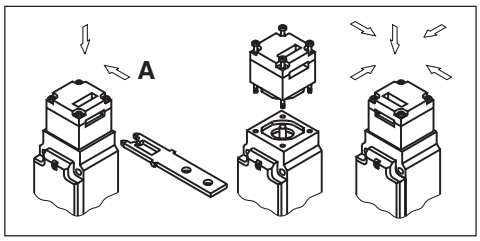
TP3...: Actuator inserted, mechanically locked, unlock by applying voltage.
TP4...: Lock by applying voltage.

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.



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 41) or by welding, riveting, pinning. The safety switch must not be used as an end stop.

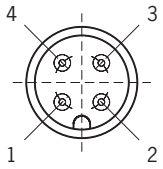
⚠ The complete safety switch must be replaced in the event of faults.

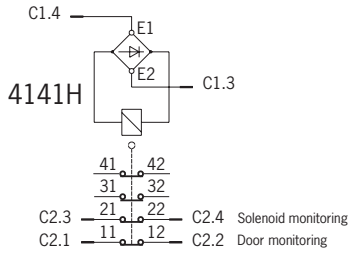
Technical data

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 10^6 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 ⊖ + 2 NC ⊖		
Switching principle	Dependent action contact element		
Contact material	silver alloy, gold flashed		
Rated impulse withstand voltage U_{imp}	2.5		kV
Rated insulation voltage U_i	250		V≅
Utilization category to IEC 947-5-1	AC-15 I_e 1.5 A U_e 230 V / DC-13 I_e 1.5 A U_e 24 V		
Switching voltage min. at 10 mA	12		V
Switching current min. at 24 V	1		mA
Conventional thermal current I_{th}	2		A
Short circuit protection (control circuit fuse)	to IEC 60269-1: 2 A gG		
Connection method	2 M12 plug connectors		
Connection to switching element	Screw terminals, max. cross-section of a single connector 1.5 mm^2		mm^2
Solenoid			
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
Insertion depth (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 TP...C2012 / TP...C2013

View of connection side of plug connector C1 and C2





Ordering table (further types available on request)

Series / Locking method / Connection type	Switching element	Increased over-travel	Article	Order No. Solenoid operating voltage 024
TP3-...C2012 Mechanical locking, M12 plug connector left	**4141H**	**A** (seitlich)	TP3-4141HA024SM4C2012	087 425
TP4-...C2012 Electrical locking, M12 plug connector left			TP4-4141HA024SM4C2012	092 772
TP3-...C2013 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
TP3-4141H A 024 SM4 C2012 **Order No. 087 425**

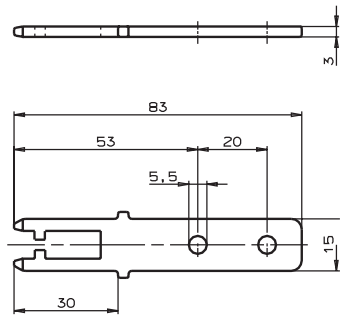
Accessories

Standard actuators

Straight actuator

(incl. 2 safety screws M5x10)

Article	Order No.
Actuator-P-G	059 226

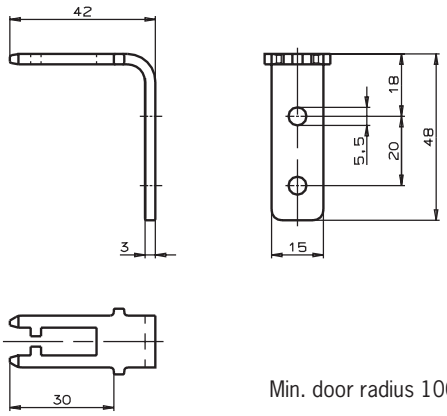


Min. door radius 1000 mm

Bent actuator

(incl. 2 safety screws M5x10)

Article	Order No.
Actuator-P-W	059 227

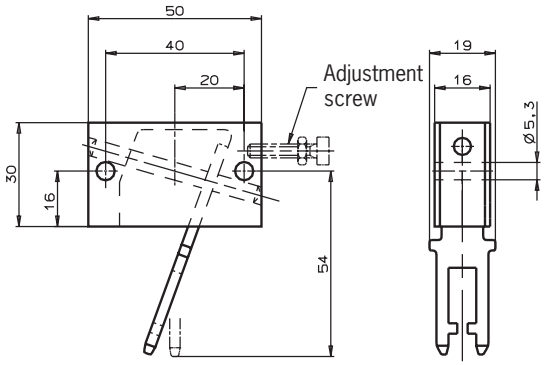


Min. door radius 1000 mm

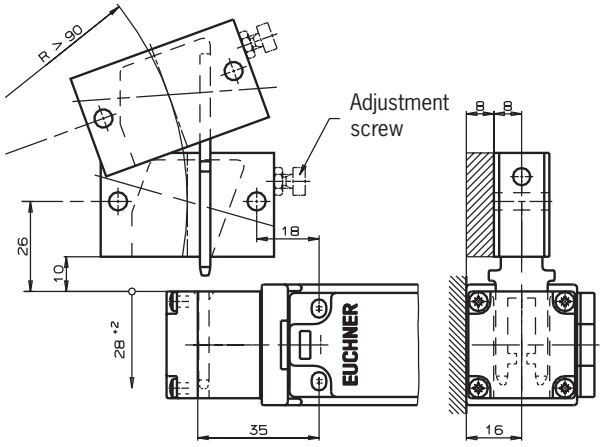
Hinged actuator for top and bottom hinged doors

(incl. 2 safety screws M5x25)

Article	Order No.
Hinged actuator P-OU	070 050



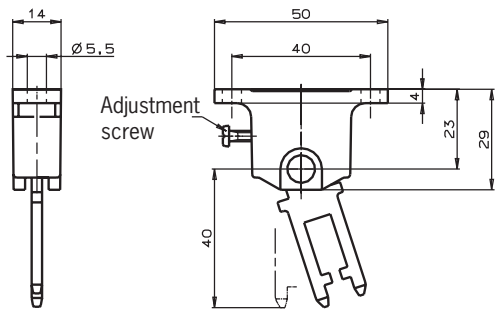
Min. door radius 90 mm



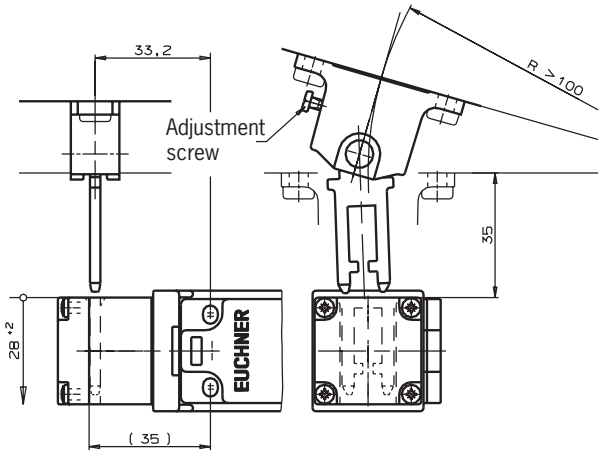
Hinged actuator for right and left hinged doors

(incl. 2 safety screws M5x10)

Article	Order No.
Hinged actuator P-LR	059 440



Min. door radius 100 mm

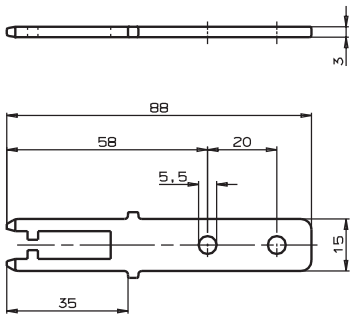


Overtravel actuators

Straight actuator

(incl. 2 safety screws M5x10)

Article	Order No.
Actuator-P-GN	074 570

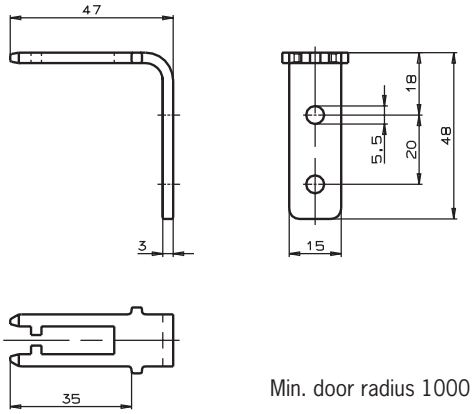


Min. door radius 1000 mm

Bent actuator

(incl. 2 safety screws M5x10)

Article	Order No.
Actuator-P-WN	074 571

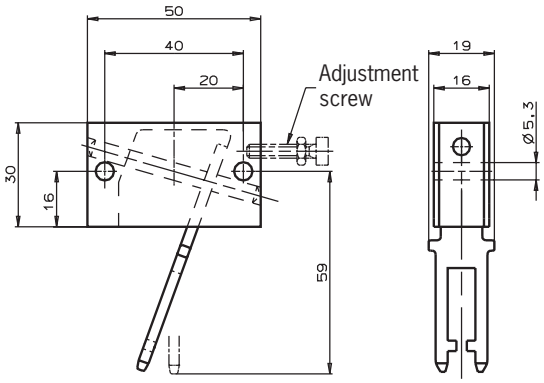


Min. door radius 1000 mm

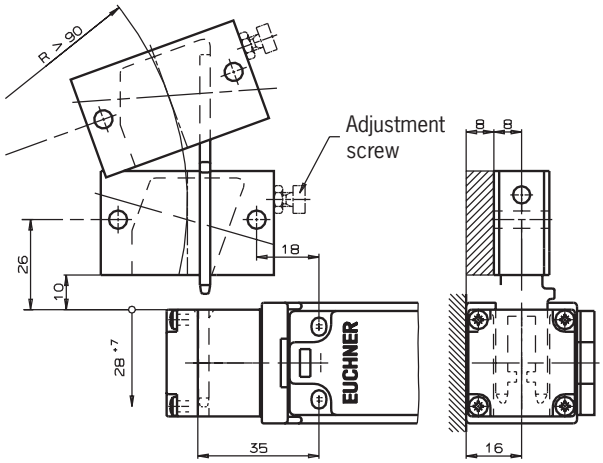
Hinged actuator for top and bottom hinged doors

(incl. 2 safety screws M5x25)

Article	Order No.
Hinged actuator P-OUN	074 572



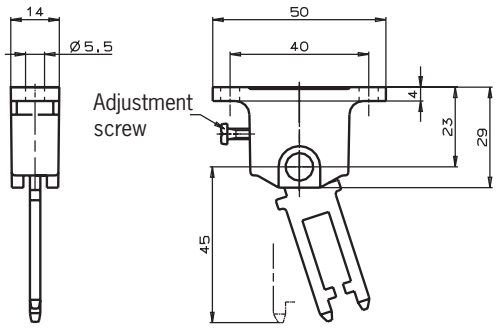
Min. door radius 90 mm



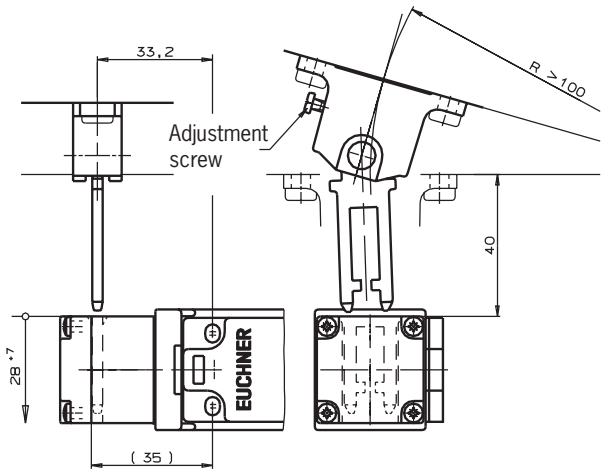
Hinged actuator for right and left hinged doors

(incl. 2 safety screws M5x10)

Article	Order No.
Hinged actuator P-LRN	074 573



Min. door radius 100 mm

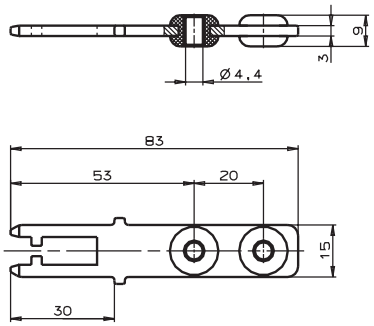


Standard actuators with rubber bush

Straight actuator

(incl. 2 safety screws M4x14)

Article	Order No.
Actuator-P-GT	070 046

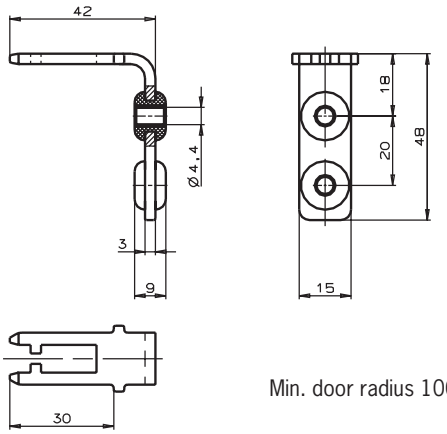


Min. door radius 1000 mm

Bent actuator

(incl. 2 safety screws M4x14)

Article	Order No.
Actuator-P-WT	070 038



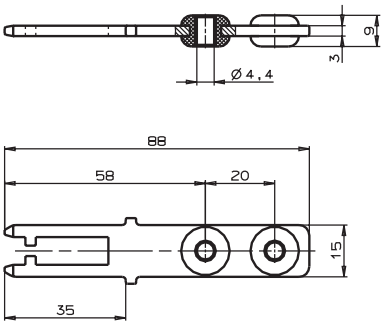
Min. door radius 1000 mm

Overtravel actuators with rubber bush

Straight actuator

(incl. 2 safety screws M4x14)

Article	Order No.
Actuator-P-GNT	074 576

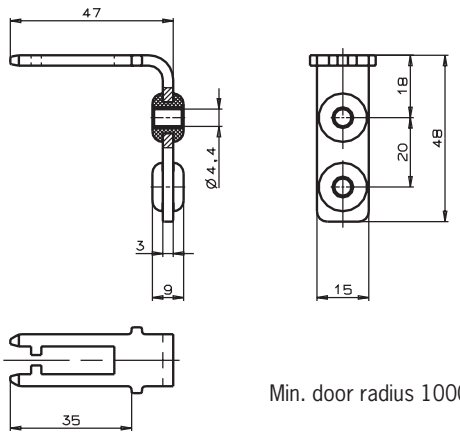


Min. door radius 1000 mm

Bent actuator

(incl. 2 safety screws M4x14)

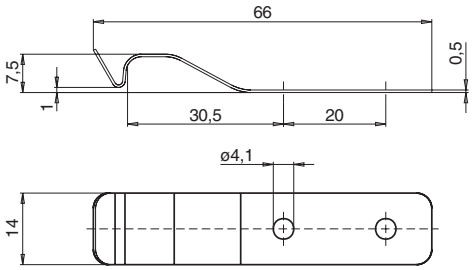
Article	Order No.
Actuator-P-WNT	074 577



Min. door radius 1000 mm

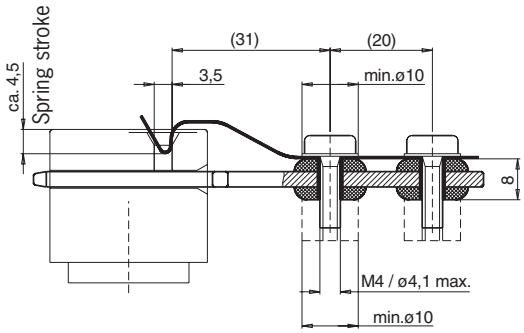
Latch spring for increased retention force
(for safety switches NP/GP or TP in unlocked condition)

Article	Order No.
Latch spring NP/TP	076 501



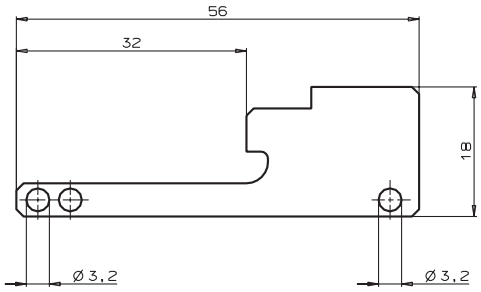
Notes
- The latch spring provides an increased retention force of approx. 30 N
- May only be used in conjunction with the straight actuator with rubber bush (Order No. 070 046)

Installation example



Lockout bar

Article	Order 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.

Safety screws

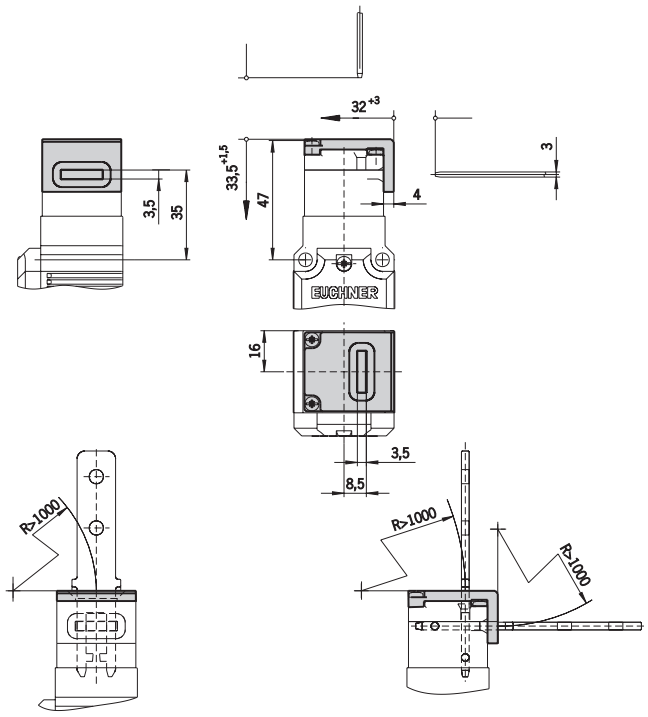
Screw type	Use	Packaging unit	Article	Order No.
M5x10 Material stainless steel	▶ for straight actuator ▶ for bent actuator ▶ for hinged actuators for right and left hinged doors	100 pieces	M5x10/V100	086 231
M5x25	▶ for hinged actuators for top and bottom hinged doors	100 pieces	M5x25/V100	073 457
M4x14 Material stainless steel	▶ for straight actuator/ bent with bush	100 pieces	M4x14/V100	086 232
3x30 self-tapping screw (plastite)	▶ for actuation heads NP...A, GP... and TP...A	100 pieces	3x30/V100	075 532

Replacement screws (not safety screws)

Screw type	Use	Packaging unit	Article	Order No.
3x30 self-tapping screw (plastite) Material stainless steel	▶ for actuation heads NP...A, GP... and TP...A	100 pieces	3x30/V100	082 237
3x38 self-tapping screw (plastite)	▶ for actuation heads NP...K, TP...K	100 pieces	3x38/V100	076 755

Insertion funnel NP/GP/TP

(for safety switches NP/GP/TP)



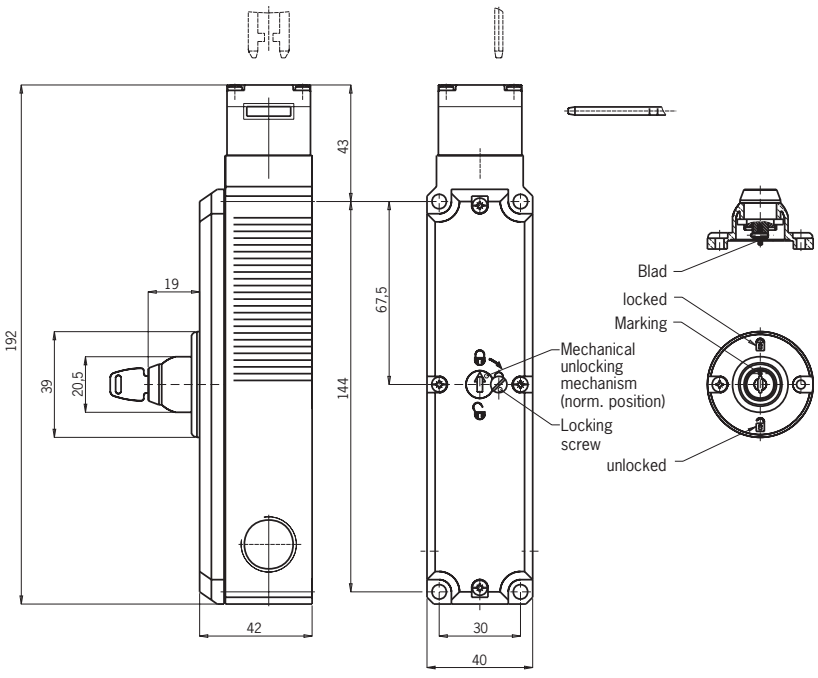
The insertion funnel provides the actuator with a wider entry area into the safety switch. With the insertion funnel the switch head is better protected against damage.
M3x34 self-tapping screws (plastite, supplied) are used to secure it to the actuation head.

Notes

- May only be used in conjunction with safety switches NP...A, GP... 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 self-tapping screws (plastite, supplied)

Article	Order No.
Insertion funnel NP/GP/TP	086 237

Lock (mechanical key unlocking mechanism)



Warning

The two locks listed as Order 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).

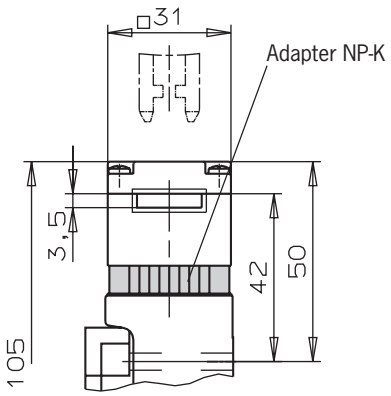
Notes

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

Description	Order 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.

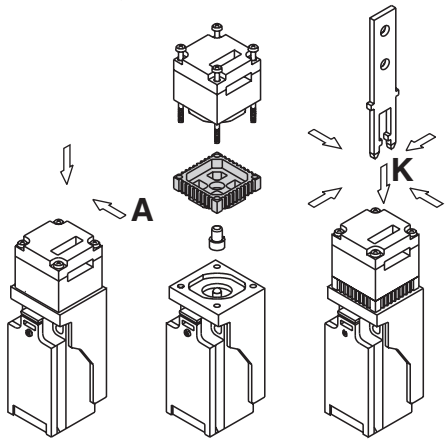
Notes

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

Ordering table

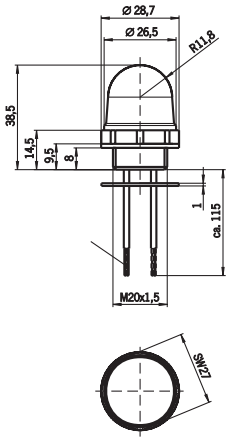
Article	Order No.
Adapter NP-K	074 578

Assembly



Built-in LED

Dimension drawing



Application

The built-in LED is suitable for direct installation in one M20x1.5 thread of the three cable entries in safety switch GP.../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
Degree of protection	IP 65

Ordering table

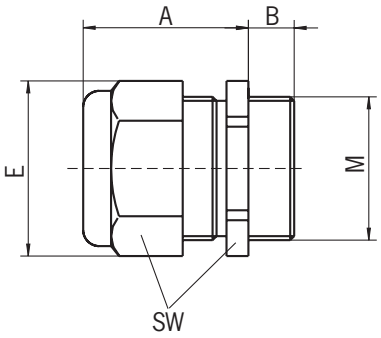
Article	Order No.
Built-in LED	087 423

Cable glands (plastic)

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

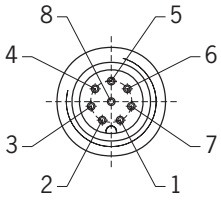
M	Outer cable diameter D	A	B	E	SW	Article	Order No.
M20 X 1.5	6-12	max. 28	11	27	24	EKPM20/06	086 233

Data in mm

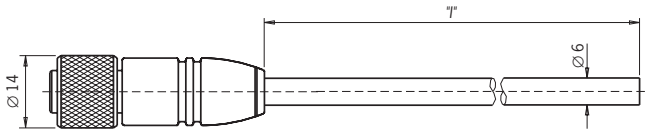


M12 plug connector (8-pole socket) with connection cable For TP...C1992 safety switches

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



Technical data

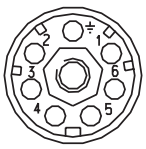
Parameters	Value
Plug connector	Straight 8-pole M12 socket plug Screw connection Connecting knurled nut connected to cable screen
Connection cable	8 x 0.25 mm² screened Outer sheath PVC

Ordering table

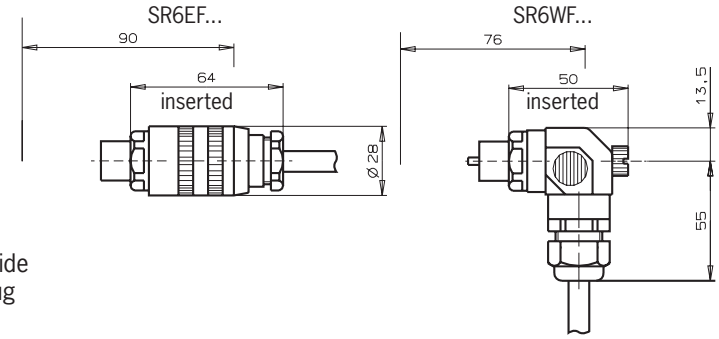
Cable length "l"	Order No.
5 m	077 751
10 m	077 752
15 m	077 753
20 m	077 871
25 m	077 872
50 m	077 873

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

Socket pin	Wire number
1	1
2	2
3	3
4	4
5	5
6	6
⏚	7



View of connection side of 7-pole socket plug



Technical data

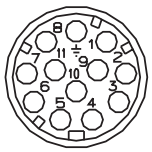
Parameters	Value
Housing material	plastic
Number of poles	6 + PE
Nominal voltage	250 V≅
Degree of protection to IEC 60,529	IP65 /inserted)
Connection cable	PUR grey
Outer diameter	∅ 8 mm
Wire cross-section	1.0 mm²

Ordering table

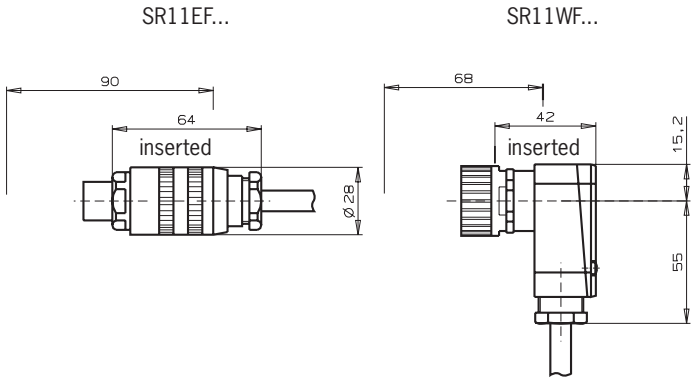
Plug version	Connection cable	Article designation	Order No.
Socket straight	None	SR6EF	013 176
	5 m	SR6EF-5000	077 632
	10 m	SR6EF-10000	077 633
	15 m	SR6EF-15000	077 634
Socket right angle	None	SR6WF	024 999
	5 m	SR6WF-5000	077 638
	10 m	SR6WF-10000	077 639
	15 m	SR6WF-15000	077 640

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

Socket pin	Wire number
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
⏚	12



View of connection side of 12-pole socket plug



Technical data

Parameters	Value
Housing material	plastic
Number of poles	11 + PE
Nominal voltage	50 V≅
Degree of protection to IEC 60,529	IP65 /inserted)
Connection cable	PUR grey
Outer diameter	∅ 10.5 mm
Wire cross-section	1.0 mm²

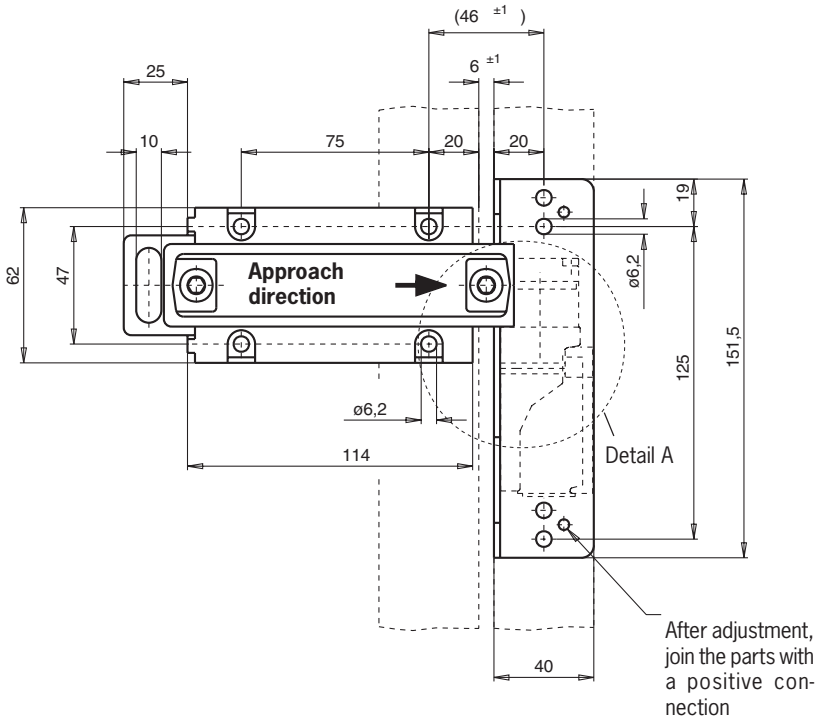
Ordering table

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

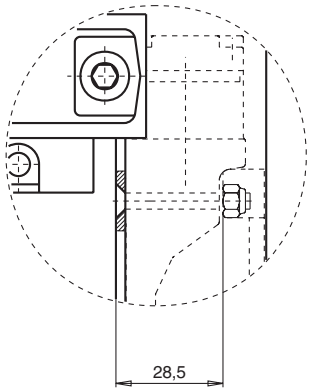
Bolt NP

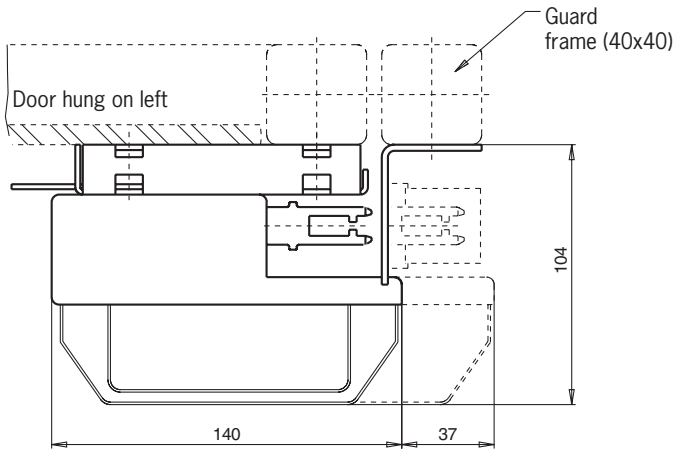
- **For NP...AS safety switches**

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

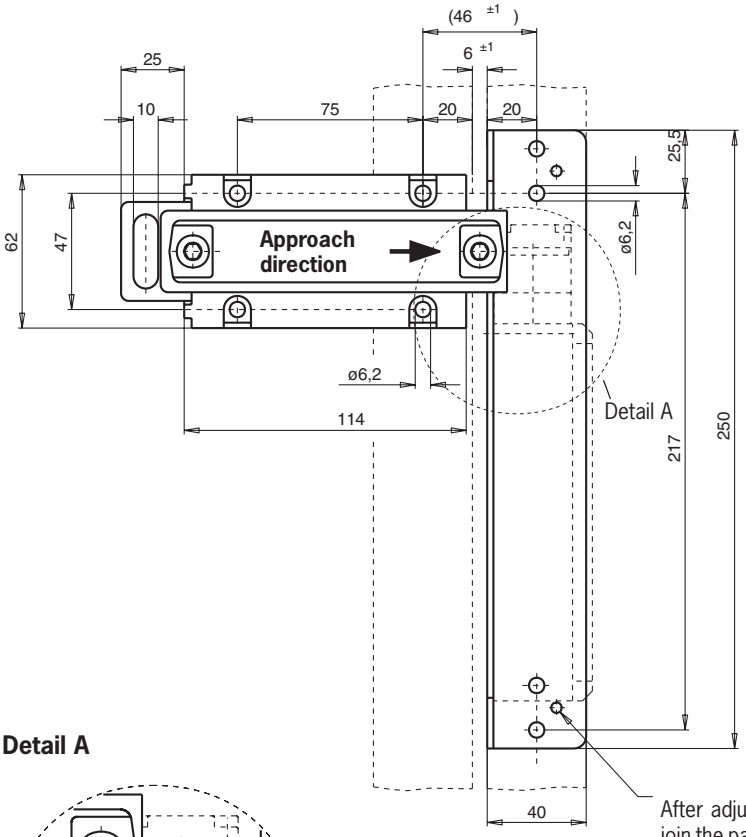
Ordering table

Article	Order No.
Bolt O NP/TP without snap-in function	073 535
Bolt 1 NP/TP with snap-in mechanism, 1 x snap-in function closed	073 536
Switch bracket NP	073 538

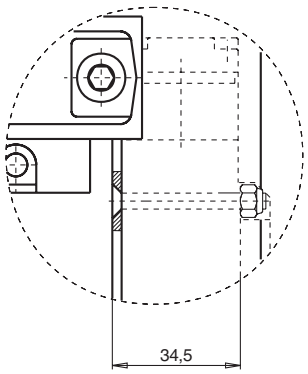
Bolt TP

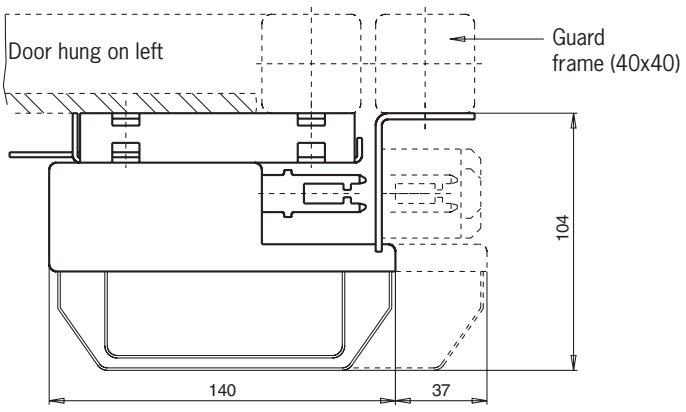
▶ **For GP... and TP...A safety switches**

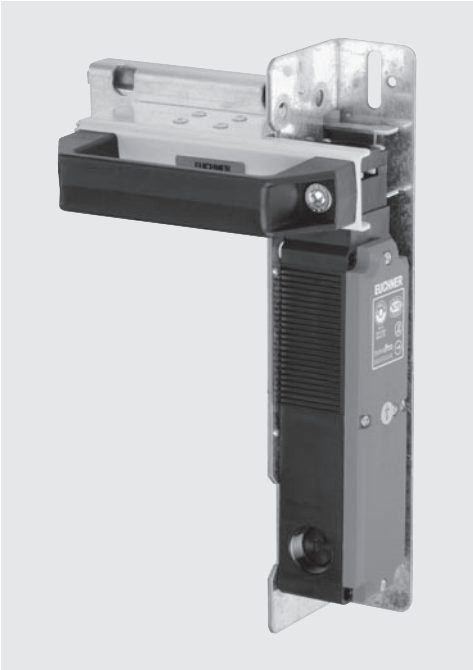
Dimension drawing
Bolt TP for right or left hinged doors



Detail A







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

Article	Order No.
Bolt 0 NP/TP without snap-in function	073 535
Bolt 1 NP/TP with snap-in function, 1 x snap-in function closed	073 536
Switch bracket TP	073 539

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.

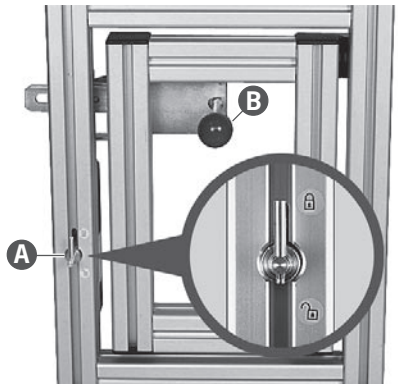


Fig. 1: Safety switch with bolt (rear view)

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.

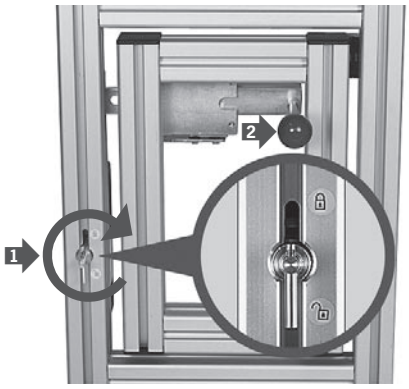


Fig. 2: Emergency release with lever activated

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.

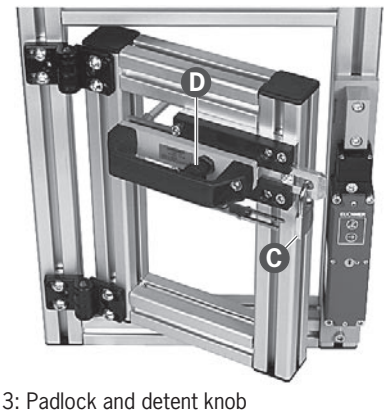


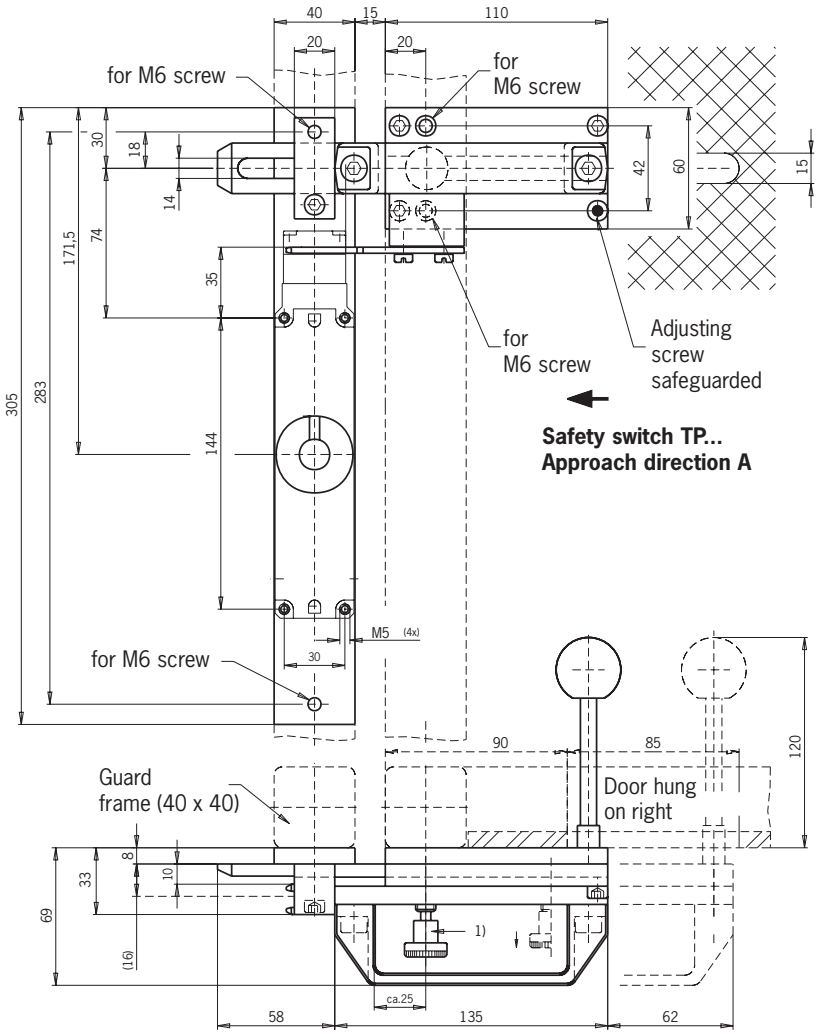
Fig. 3: Padlock and detent knob

Bolt TP-.F

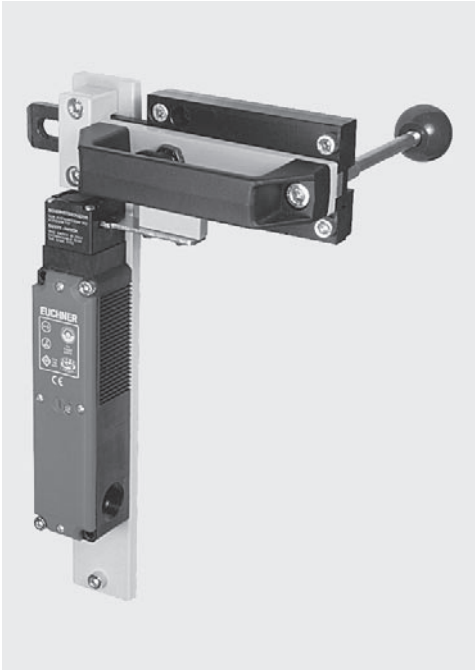
- **For safety switches GP.../TP... and safety switches with emergency release TP...A.-C1743 and TP...A.-C1993**
- **Emergency release lever to escape from out of the hazardous area**

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

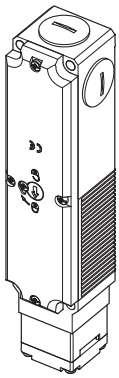
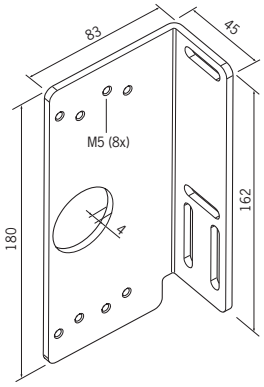
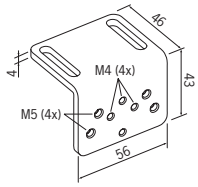
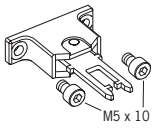
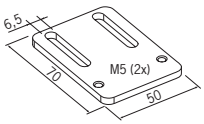
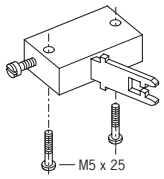
Notes

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

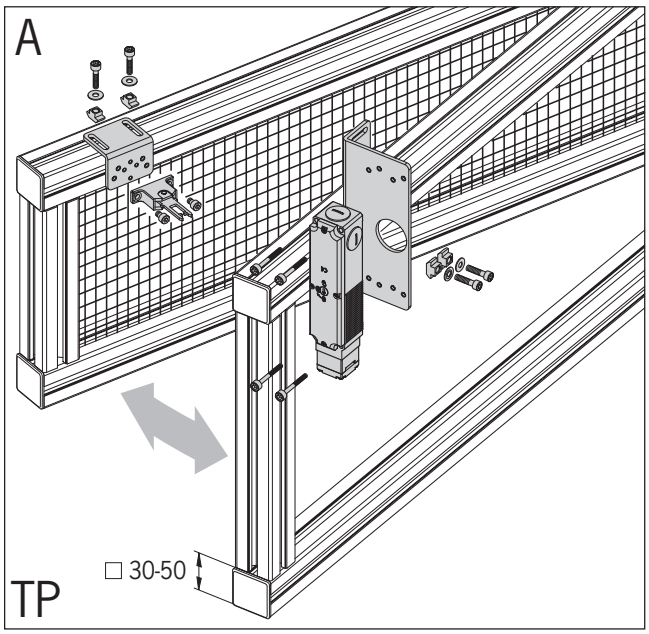
Ordering table

Article	Order No.
Bolt TP-AF (with emergency release) for right hinged doors	086 186
Bolt TP-CF (with emergency release) for left hinged doors	086 188
Bolt TP-A (without emergency release) for right hinged doors	084 430
Bolt TP-C (without emergency release) for left hinged doors	084 432

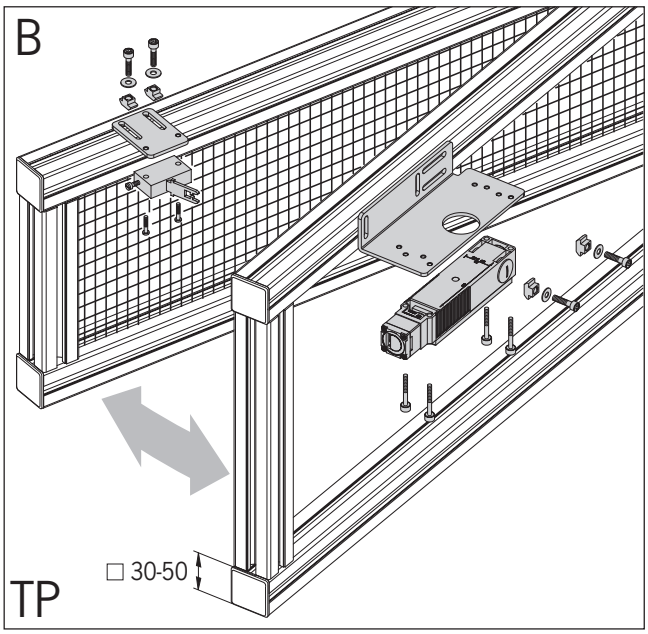
Mounting plates EMP for TP...A Safety Switches

Switch	Switch mounting type	Switch mounting plate	Actuator mounting plate	Actuator see page 38 - 40	Minimum distance hinged actuator to switch
TP...A 	**A** vertical	**EMP-SB** Order No. 093 456 	**EMP-B1** Order No. 093 457 	Order No. 070 038 074 577 Angle actuator	> 1000 mm
				Order No. 059 440 074 573 	> 100 mm
	B horizontal		**EMP-B2** Order No. 093 458 	Order No. 070 050 074 572 	> 90 mm

Mounting A, safety switch vertical



Mounting B, safety switch horizontal



Note

- Mounting plate material: St37 galvanized.
- The EMP mounting plate is suitable for the TP...A safety switch only. The TP...K safety switch (with adapter) is not usable in combination with the mounting plates.
- The EMP-SB mounting plate is also suitable for the TP...C1743 and TP...C1993 safety switches with emergency release from the rear.

Index sorted by article

Index sorted by catalogue number

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