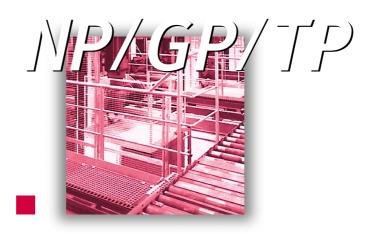
# **Safety Switches**









# More than safety.







# Around the world – the Swabian specialists in motion sequence control for mechanical and sys-

tems 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

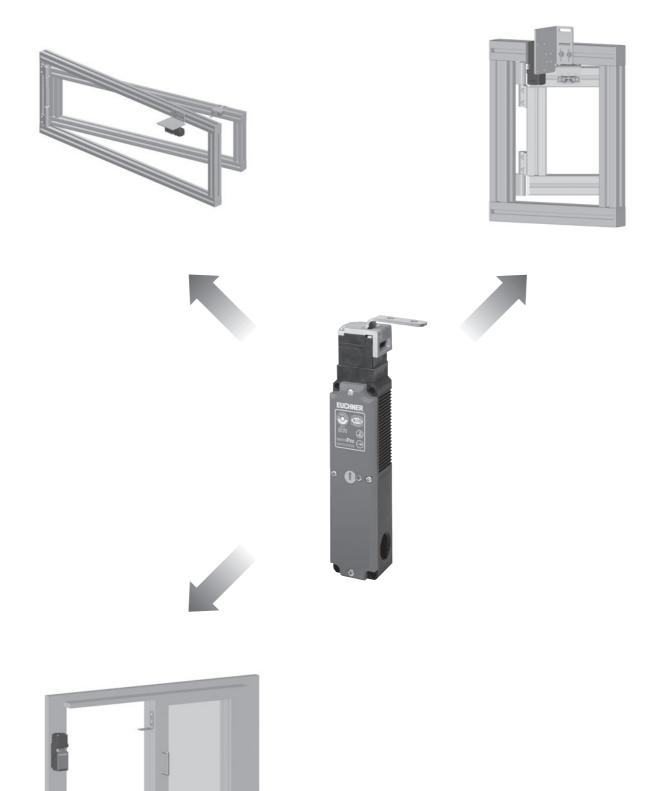
# **EUCHNER-**Safety switches in the NP series ... offer important advantages

- ▶ 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 ...



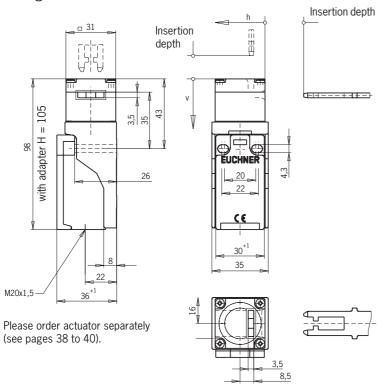
- ▶ With 1, 2 or 3 contact elements
- ► Cable entry M20x1.5 or
  Plug connector SR6 (relevant plug connectors see page 45)

# SUVA CNA (IL)

\* for cable entry M

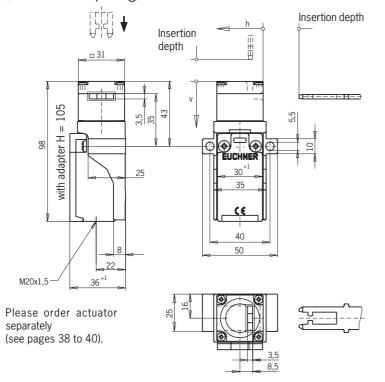
# **Dimension drawing NP1-AS**

(Fixing to EN 50047)



#### **Dimension drawing NP1-AB**

(40 mm hole spacing)



# **Switching elements**

(dependent action contact element)

618 1 positively driven NC contact

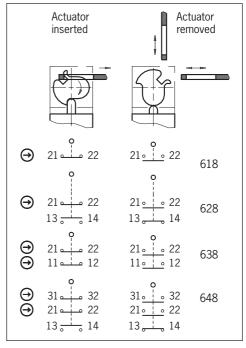
1 positively driven NC contact + 1 NO

contact

**638** 2 positively driven NC contacts

2 positively driven NC contacts +

1 NO contact

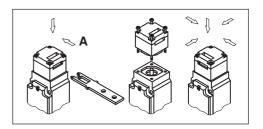


#### **Installation notes**

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

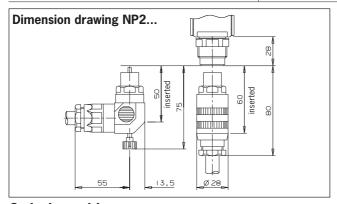
Upon removal of the actuator head fixing screws, the approach direction can be changed to any  $90^{\circ}$  increment. The standard setting is approach direction A.

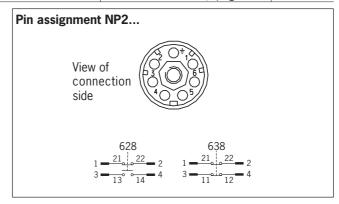


The complete safety switch must be replaced in the event of faults.



Parameters	Value						
Housing material		Glass fiber reinforced thermoplastic					
Degree of protection to IEC 60529		IP 67 for M20x1	.5 / IP 65 for S	SR6			
Mounting position		- 1	ional				
Mechanical service life		1 x 10 <sup>6</sup> swit	tching cycles				
Ambient temperature			08+ 0		°C		
Approach speed, max.			20		m/min		
Weight			x. 0.11		kg		
Switching element	618	628	638	648			
Contact elements	1 NC →	1 NC → + 1 NO		2 NC → + 1 NO			
Switching principle		Dependent action		ent			
Contact material		Silve	r alloy				
Rated impulse withstand voltage U <sub>imp</sub>			5		kV		
Rated insulation voltage U <sub>i</sub>		NP1: $U_i = 400$			V≅		
Utilization category to IEC 947-5-1	AC-1	15 le 4 A Ue 230 V	/ DC-13 le 4 A	\ Ue 24 V			
Switching voltage min. at 10 mA		2	24		V		
Switching current min. at 24 V		3	30		mA		
Conventional thermal current I <sub>th</sub>			4		A		
Short circuit protection (control circuit fuse)			59-1: 4 A gG				
Connection method NP1			nal, M20x1.5				
Connection method NP2		Plug conr	ector SR6				
Connection to switching element		s, max. cross-section	on of a single o	connector 1.5 mm <sup>2</sup>			
<b>Insertion depth</b> (necessary minimum travel + permissible overtravel)	Standard	d actuator	Overtra	vel actuator			
Approach direction side (h)	28 + 2		28 + 7		mm		
Approach direction from top (v)	20.5	+ 1.5		.5 + 7 adapter NP-K	mm		
Approach direction from top (v)	29.5	+ 1.5		4 578 / page 45	111111		





# **Ordering table**

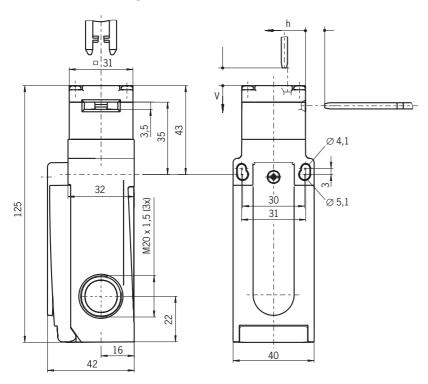
Series / Connection type / Installation method	Switching element	Increased over- travel	Article	Contact elements	Order No.
NP1AS-M	618		NP1-618AS-M	1 pos. driven NC	083 685
Cable entry	628		NP1-628AS-M	1 pos. driven NC + 1 NO	083 688
Fitting to	638		NP1-638AS-M	2 pos. driven NC	083 691
EN 50047	648	Α	NP1-648AS-M	2 pos. driven NC + 1 NO	082 280
NP1AB-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
NP2AS Plug connector SR6	628		NP2-628AS	1 pos. driven NC + 1 NO	059 447
Fitting to EN 50047	638	<b>A</b> (side)	NP2-638AS	2 pos. driven NC	059 449
NP2AB 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

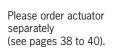
 $\textbf{Ordering example:} \quad \textbf{NP1,} \text{ switching element 638, increased overtravel side A, } 40 \text{ mm hole spacing (B), } \text{ cable entry M}$ 

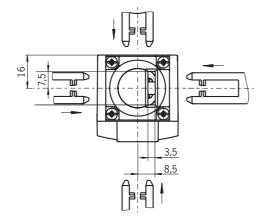
NP1-638AB-M Order No. 083 690

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

# Dimension drawing GP1...







# **Assembly instructions**

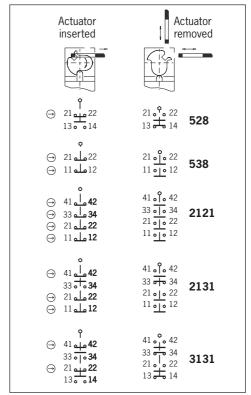
The safety switch and actuator must be installed properly. The actuator must be positively connected with the mounting surface, e.g. by using safety screws (see page 41) or by welding, riveting, pinning. The safety switch must not be used as an end stop.



\* Approvals pending

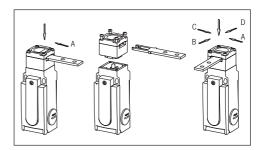
#### **Switching elements**

528	1 positively driven INC 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.



Parameters	Value					Unit		
Housing material		Reinforced thermoplastic						
Degree of protection			IP 67	,				
according to IEC 60529			IF 07					
Installation position			Any					
Mechanical life		2 x	106 operat	ing cycles				
Ambient temperature			- 20 to +	- 80		°C		
Approach speed, max.			20			m/min		
Insertion/extraction force			8/25			N		
Weight			Approx. (			kg		
Switching element	528	538	2121	2131	3131			
Contact elements	1 NC → + 1 NO	2 NC $\ominus$	4 NC $\ominus$	3 NC → + 1 NO	2 NC → + 2 NO			
Switching principle		Slow-	action cont	act element				
Contact material		Silv	er alloy, go	ld flashed				
Rated impulse withstand voltage U <sub>imp</sub>			2.5			kV		
Rated insulation voltage U <sub>i</sub>			250			V≅		
Utilization category according to IEC 947-5-1	AC	:-15 l <sub>e</sub> 4 A L	l <sub>e</sub> 230 V / [	DC-13 l <sub>e</sub> 4 A U <sub>e</sub> 2	4 V			
Switching voltage, min. at 10 mA			12			V		
Switching current, min. at 24 V			1			mA		
Conventional thermal current I <sub>th</sub>			4			A		
Short circuit protection (control circuit fuse)				)269-1: 4 A gG				
Connection method GPM		Scre	w terminal	, M20x1.5				
Connection to switching element	Screw ter	rminals, ma	x. cross-se	ction of a single	connector 1.5	mm <sup>2</sup>		
Insertion depth	Standard	dactuators		Overtravel	octuators			
(necessary minimum travel + permissible overtravel)				Overtravel actuators				
Approach direction side (h)		3 + 2		28 +		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.
	528		GP1-528A-M	1 positively driven NC contact + 1 NO contact	089 725
	538		GP1-538A-M	2 positively driven NC contacts	090 250
GP1M	2121	Α	GP1-2121A-M	4 positively driven NC contacts	090 252
cable entry	2131	(side + top)	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.

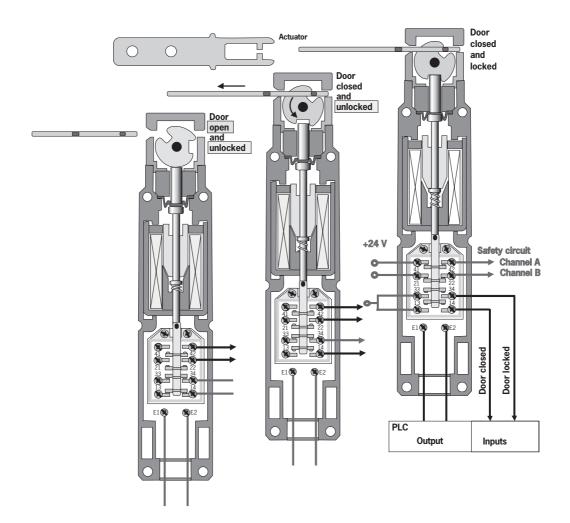
#### Door open and unlocked

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.

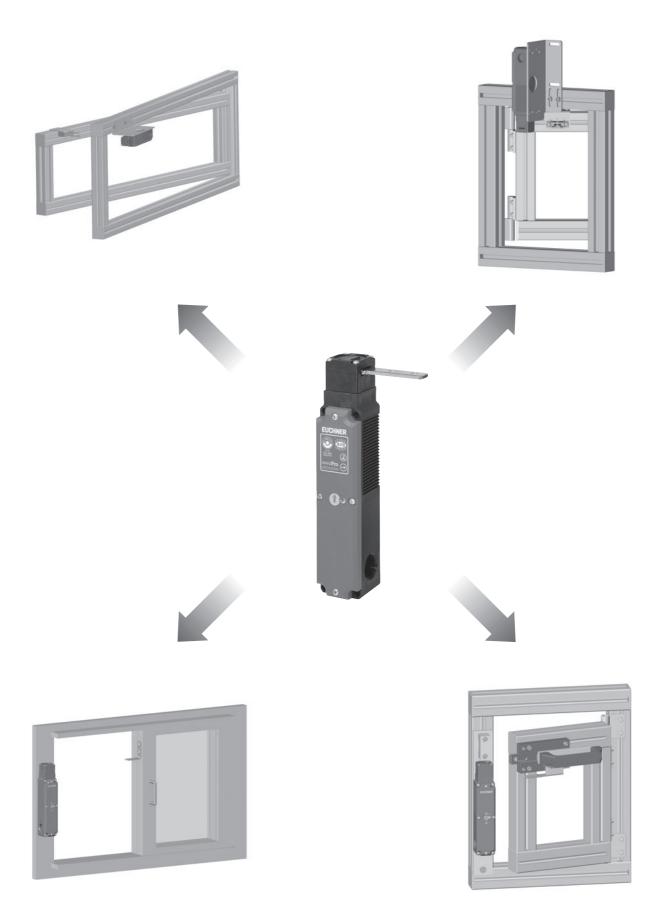
Since the solenoid plunger and the cam disc are positively connected, the NC contacts 21-22 & 41-42 remain securely open. This design feature of the guard-locking device ensures that the locking mechanism (solenoid plunger) cannot lock if the safety guard is open. This is also mentioned in BGI 575 **Protection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

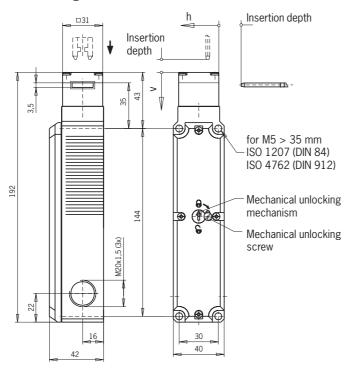


# Applications for TP... series Safety Switches

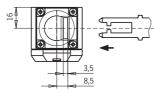


- ▶ With 2 contact elements
- ▶ With door monitoring contact for TP3.../TP4...
- ► Cable entry M20x1.5 or
  Plug connector SR6 (relevant plug connectors see page 45)

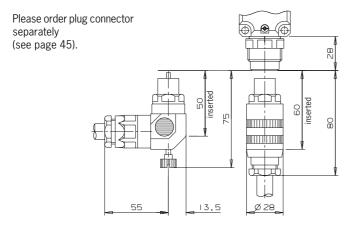
#### Dimension drawing TP...M



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



# **Dimension drawing TP...SR6**



#### **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.



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

#### **Switching elements**

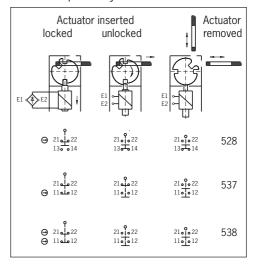
(dependent action contact element)

528 1 positively driven NC contact + 1 NO contact

**537** 1 positively driven NC contact +

1 NC contact as door monitoring contact

**538** 2 positively driven NC contacts



# **Locking methods**

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

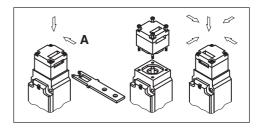
**TP2.../ TP4...:** Lock by applying voltage.

# Mechanical unlocking mechanism

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

#### Changing the approach direction

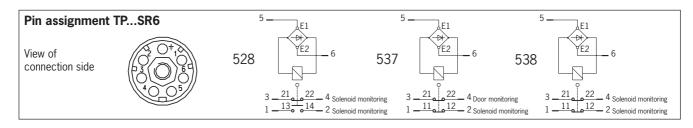
Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction A.



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



Parameters	Value					
Housing material	Glass	fiber reinforce	d thermop	olastic		
Degree of protection to IEC 60529	TP.	M: IP 67 / TF	PSR6: IP	65		
Mounting position		option	al			
Mechanical service life		1 x 10 <sup>6</sup> switch	ing cycles			
Ambient temperature		- 20 to +	- 55		°C	
Approach speed, max.		20			m/min	
Insertion/extraction force (not locked)	TP1, TP2: approx	x. 8 / TP3: app	orox. 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		ndent action c				
Contact material		silver alloy, go	ld flashed			
Rated impulse withstand voltage U <sub>imp</sub>	2.5					
Rated insulation voltage U <sub>i</sub>	250					
Utilization category to IEC 947-5-1	AC-15 l <sub>e</sub> 6	A $U_e$ 230 V $/$ I	DC-13 l <sub>e</sub> 6	A U <sub>e</sub> 24 V		
Switching voltage min. at 10 mA		12			V	
Switching current min. at 24 V		10			mA	
Conventional thermal current I <sub>th</sub>		6			Α	
Short circuit protection (control circuit fuse)		to IEC 60269-				
Connection method TPM		Screw terminal	, M20x1.5	)		
Connection method TPSR6		Plug connec	tor SR6			
Connection to switching element	Screw terminals, max.	cross-section (	of a single	connector 1.5 mm <sup>2</sup>	mm <sup>2</sup>	
Solenoid						
Connection	reverse polarit	y protected, in	tegrated l	oridge rectifier		
Solenoid operating voltage	24 V AC/DC, 1	110 V AC, 230	V AC (all	-15% / +10%)		
Duty cycle	100					
Power consumption	8				W	
Insertion depth (necessary minimum travel + permissible overtravel)	Standard actuat	or	Overtr	ravel actuator		
Approach direction side (h)	28 + 2			28 + 7	mm	
Approach direction from top (v)	29.5 + 1.5					



# **Ordering table**

Series /	Cwitching	Increased		Order No.			
Locking method /	Switching element	over-	Article	Solenoid operating voltage			
Connection type	elellielli	travel		024	110	230	
TP1M / TP3M	528		TP1-528AM	084 295	084 300	084 304	
Mechanical locking,	537		TP3-537AM	084 336	084 337	084 338	
Cable entry	538	Α	TP1-538AM	084 310	084 315	084 320	
TP2M / TP4M	528	(side)	TP2-528AM	084 325	084 330	084 332	
Electrical locking,	537		TP4-537AM	084 339	084 340	084 341	
Cable entry	538		TP2-538AM	084 333	084 334	084 335	
TP1SR6 / TP3SR6	528		TP1-528ASR6	087 431	087 435	087 438	
Mechanical locking,	537		TP3-537ASR6	087 434	087 437	087 440	
Plug connector SR6	538	Α	TP1-538ASR6	087 433	087 436	087 439	
TP2SR6 / TP4SR6	528	(side)	TP2-528ASR6	087 441	087 444	087 448	
Electrical locking,	537		TP4-537ASR6	087 443	087 447	087 450	
Plug connector SR6	538		TP2-538ASR6	087 442	087 446	087 449	

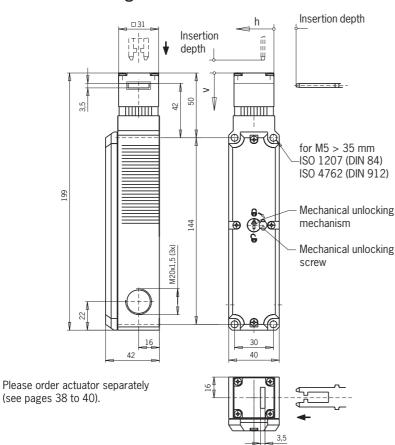
Ordering example: TP2, electr. locking, switching element 528, increased overtravel side A,

solenoid operating voltage 230 V AC, cable entry M

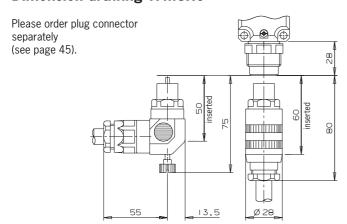
TP2-528 A 230 M Order No. 084 332

- ▶ 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)

#### Dimension drawing TP...M



#### **Dimension drawing TP...SR6**



#### **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.



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

#### **Switching elements**

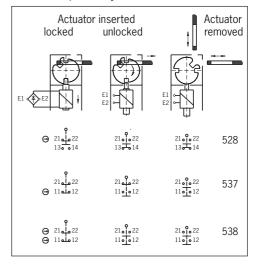
(dependent action contact element)

1 positively driven NC contact + 1 NO

**537** 1 positively driven NC contact +

1 NC contact as door monitoring contact

**538** 2 positively driven NC contacts



#### **Locking methods**

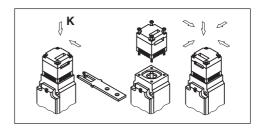
TP1.../ TP3...: Actuator inserted, mechanically locked, unlock by applying voltage.
TP2.../ TP4...: Lock by applying voltage.

#### 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

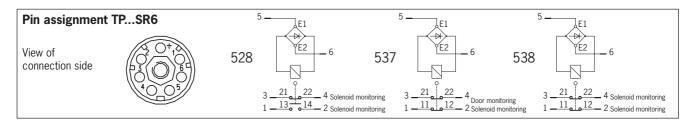
Upon removal of the actuator head fixing screws, the approach direction an be changed to any  $90^{\circ}$  increment. The standard setting is approach direction K.



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



Parameters	Value					
Housing material	Glass f	fiber reinfor	ced thermo	plastic		
Degree of protection to IEC 60529	TP	.M: IP 67 /	TPSR6: IF	65		
Mounting position		opti	onal			
Mechanical service life	1	x 10 <sup>6</sup> swit	ching cycle:	S		
Ambient temperature		- 20 to	55 + 5		°C	
Approach speed, max.		2	.0		m/min	
Insertion/extraction force (not locked)			ox. 8		N	
Retention force when locked		12	200		N	
Weight			x. 0.5		kg	
Switching element	528		37	538		
Contact elements	1 NC → + 1 NO	1 NC $\ominus$	+ 1 NC	2 NC ⊖		
Switching principle			n contact ele			
Contact material	S		gold flashed	d		
Rated impulse withstand voltage U <sub>imp</sub>	2.5					
Rated insulation voltage U <sub>i</sub>			50		V≅	
Utilization category to IEC 947-5-1	AC-15 l <sub>e</sub> 6 A	4 U <sub>e</sub> 230 V	/ DC-13 l <sub>e</sub> 6	5 A U <sub>e</sub> 24 V		
Switching voltage min. at 10 mA		1	2		V	
Switching current min. at 24 V		1	0		mA	
Conventional thermal current I <sub>th</sub>			5		A	
Short circuit protection (control circuit fuse)			59-1: 6 A gO			
Connection method TPM	S		nal, M20x1.	5		
Connection method TPSR6			ector SR6			
Connection to switching element	Screw terminals, max. c	ross-sectio	n of a single	e connector 1.5 mm <sup>2</sup>	mm <sup>2</sup>	
Solenoid						
Connection	reverse polarity					
Solenoid operating voltage	24 V AC/DC, 1	10 V AC, 2	30 V AC (all	-15% / +10%)	%	
Duty cycle	100					
Power consumption	8				W	
Insertion depth (necessary minimum travel + permissible overtravel)	Standard actuator		Overt			
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 /	Switching	Increased			Order No.	
Locking method /	element	over-	Article	Solenoi	d operating	voltage
Connection type	elellielli	travel		024	110	230
TP1M / TP3M	528		TP1-528KM	084 342		
Mechanical locking,	537		TP3-537KM	084 347		
Cable entry	538	K	TP1-538KM	084 343	on request	
TP2M / TP4M	528	(side + top)	TP2-528KM	084 344		on request
Electrical locking,	537		TP4-537KM	084 348	084 349	
Cable entry	538		TP2-538KM	084 346	on request	
TP1SR6 / TP3SR6	528		TP1-528KSR6	088 210		
Mechanical locking,	537		TP3-537KSR6	088 213		
Plug connector SR6	538	K	TP1-538KSR6	088 212	0	on roomoot
TP2SR6 / TP4SR6	528	(side + top)	TP2-528KSR6	088 214	on request	on request
Electrical locking,	537		TP4-537KSR6	088 216		
Plug connector SR6	538		TP2-538KSR6	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

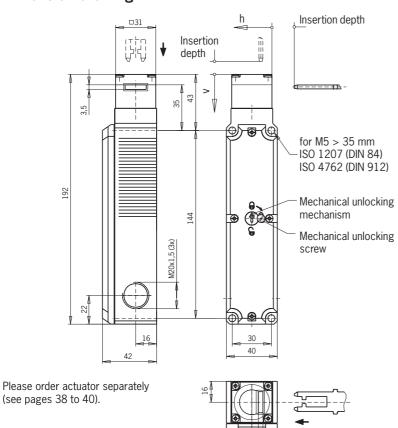
TP2-528 K 024 M Order No. 084 344



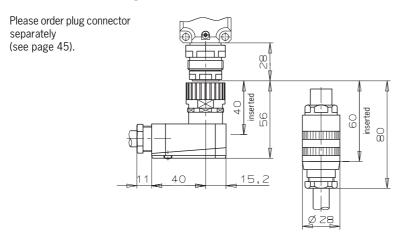
- ▶ With 4 contact elements, without door monitoring contact
- ► Cable entry M20x1.5 or
  Plug connector SR11 (relevant plug connectors see page 45)

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

# Dimension drawing TP...M



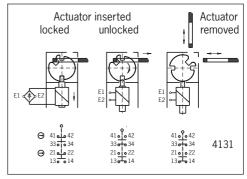
#### **Dimension drawing TP...SR11**



#### **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.

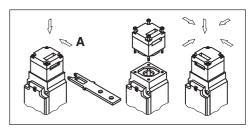
**TP2...:** Lock by applying voltage.

#### 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  $90^{\circ}$  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.



Parameters	Va	lue	Unit		
Housing material	Glass fiber reinfo	rced thermoplastic			
Degree of protection to IEC 60529	TPM: IP 67 /	TPM: IP 67 / TPSR11: IP 65			
Mounting position	opt	optional			
Mechanical service life	1 x 10 <sup>6</sup> swi	tching cycles			
Ambient temperature	- 20 t	0 + 55	°C		
Approach speed, max.	2	20	m/min		
Insertion/extraction force (not locked)		rox. 8	N		
Retention force when locked	12	200	N		
Weight	appro	ox. 0.5	kg		
Switching element	41	131			
Contact elements	2 NC ⊖	+ 2 NO			
Switching principle		n contact element			
Contact material		gold flashed			
Rated impulse withstand voltage U <sub>imp</sub>	TPM: $U_{imp} = 2.5 /$	TPSR11: U <sub>imp</sub> = 1,5	kV		
Rated insulation voltage U <sub>i</sub>		TPSR11: U <sub>i</sub> = 50	V≅		
Utilization category to IEC 947-5-1		30 V / DC-13 I <sub>e</sub> 6 A U <sub>e</sub> 24 V			
	TPSR11: AC-15 l <sub>e</sub> 4 A U <sub>e</sub>	50 V / DC-13 I <sub>e</sub> 4 A U <sub>e</sub> 24 V			
Switching voltage min. at 10 mA		12	V		
Switching current min. at 24 V		10	mA		
Conventional thermal current I <sub>th</sub>	,	TPSR11: 4	Α		
Short circuit protection (control circuit fuse)		6 A gG / TPSR11: 4 A gG			
Connection method TPM		nal, M20x1.5			
Connection method TPSR11		ector SR11			
Connection to switching element	Screw terminals, max. cross-section	on of a single connector 1.5 mm <sup>2</sup>	mm <sup>2</sup>		
Solenoid					
Connection		, integrated bridge rectifier			
Solenoid operating voltage		230 V AC (all -15% / +10%)			
Duty cycle	1	00	%		
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		



# **Ordering table**

Series /	Switching	Increased		Order No.			
Locking method /	element	over-	Article	Solenoid operating voltage			
Connection type	CICILICIIL	travel		024	110	230	
TP1M				084 115	084 116	084 117	
Mechanical locking,			TP1-4131AM				
Cable entry	4101	Α		_	_	_	
TP2M	4131	(side)	TP2-4131AM	084 125	084 126	084 128	
Electrical locking,							
Cable entry				_	_	_	
TP1SR11				088 202			
Mechanical locking,			TP1-4131ASR11		_	_	
Plug connector SR11	4101	Α		_			
TP2SR11	4131	(side)		088 203			
Electrical locking,			TP2-4131ASR11		_	_	
Plug connector SR11				_			

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

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

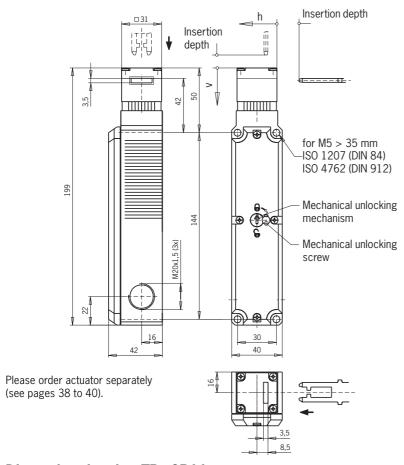
TP2-4131 A 024 M

Order No. 084 125

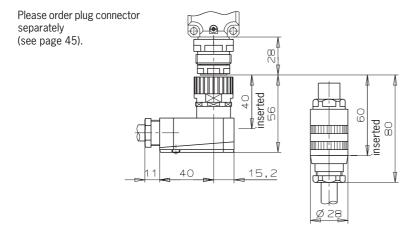


- ▶ Increased overtravel with approach direction from top
- ▶ With 4 contact elements, without door monitoring contact
- ► Cable entry M20x1.5 or
  Plug connector SR11 (relevant plug connectors see page 45)

#### **Dimension drawing TP...M**



#### **Dimension drawing TP...SR11**



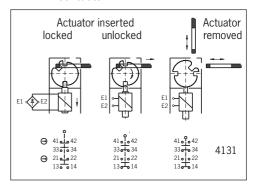


 $^{\ast}\,$  with cable entry M, 24 V DC / 110 V AC

#### **Switching elements**

(dependent action contact element)

4131 2 positively driven NC contacts +2 NO contacts



#### **Locking methods**

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

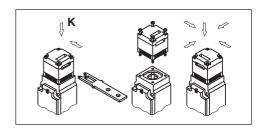
**TP2...:** Lock by applying voltage.

#### Mechanical unlocking mechanism

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

#### Changing the approach direction

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



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

#### **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.



Parameters	Va	lue	Unit		
Housing material	Glass fiber reinfo	Glass fiber reinforced thermoplastic			
Degree of protection to IEC 60529	TPM: IP 67 /	TPM: IP 67 / TPSR11: IP 65			
Mounting position	optional				
Mechanical service life	1 x 10 <sup>6</sup> swi	tching cycles			
Ambient temperature	- 20 t	0 + 55	°C		
Approach speed, max.	2	20	m/min		
Insertion/extraction force (not locked)		rox. 8	N		
Retention force when locked	12	200	N		
Weight	appro	ox. 0.5	kg		
Switching element	41	131			
Contact elements	2 NC ⊖	+ 2 NO			
Switching principle		n contact element			
Contact material		gold flashed			
Rated impulse withstand voltage U <sub>imp</sub>		TPSR11: U <sub>imp</sub> = 1,5	kV		
Rated insulation voltage U <sub>i</sub>	TPM: $U_i = 250 / \text{TPSR}11: U_i = 50$		V≅		
Utilization category to IEC 947-5-1		30 V / DC-13 I <sub>e</sub> 6 A U <sub>e</sub> 24 V			
	TPSR11: AC-15 l <sub>e</sub> 4 A U <sub>e</sub>	50 V / DC-13 l <sub>e</sub> 4 A U <sub>e</sub> 24 V			
Switching voltage min. at 10 mA	1	12	V		
Switching current min. at 24 V	1	10	mA		
Conventional thermal current Ith	,	TPSR11: 4	Α		
Short circuit protection (control circuit fuse)		6 A gG / TPSR11: 4 A gG			
Connection method TPM		nal, M20x1.5			
Connection method TPSR11		ector SR11			
Connection to switching element	Screw terminals, max. cross-section	on of a single connector 1.5 mm <sup>2</sup>	mm <sup>2</sup>		
Solenoid					
Connection		, integrated bridge rectifier			
Solenoid operating voltage		230 V AC (all -15% / +10%)			
Duty cycle	1	00	%		
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		



# **Ordering table**

•						
Series /	Switching	Increased			Order No.	
Locking method /	element	over-	Article	Solenoi	d operating	voltage
Connection type	element	travel		024	110	230
TP1M				084 150	084 254	084 255
Mechanical locking,			TP1-4131KM			
Cable entry	4121	K		_	_	_
TP2M	4131	4131 (side + top)		084 253	on request	on request
Electrical locking,			TP2-4131KM			
Cable entry				_	_	_
TP1SR11				088 217		
Mechanical locking,			TP1-4131KSR11		_	_
Plug connector SR11	4121	K		_		
TP2SR11	4131	(side + top)		088 218		
Electrical locking,			TP2-4131KSR11		_	_
Plug connector SR11				_		

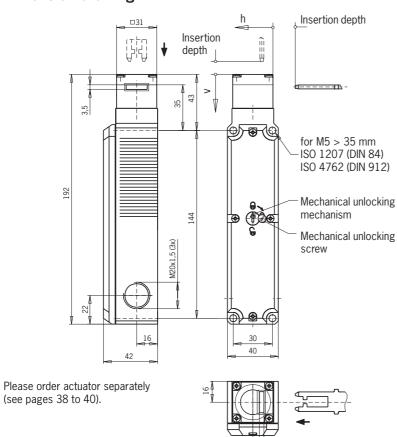
Ordering example: TP2, electr. locking, switching element 4131, increased overtravel side

and top K, solenoid operating voltage 024 V AC/DC, cable entry M TP2-4131 K 024 M  $\,$ 

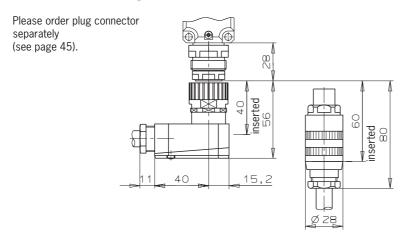
Order No. 084 253

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

# Dimension drawing TP...M



#### Dimension drawing TP...SR11



#### **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.

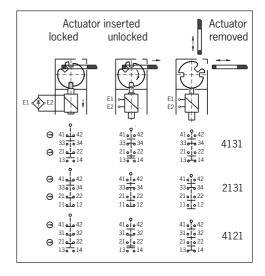


\* with cable entry M, 24 V DC / 110 V AC

#### **Switching elements**

(dependent action contact element)

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



#### **Locking methods**

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

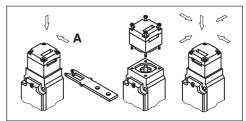
**TP4...:** Lock by applying voltage.

#### Mechanical unlocking mechanism

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

#### Changing the approach direction

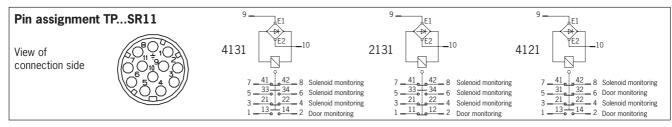
Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction A.



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



Parameters	Value				
Housing material	Glass fiber reinfo				
Degree of protection to IEC 60529	TPM: IP 67 /	TPM: IP 67 / TPSR11: IP 65			
Mounting position	opt				
Mechanical service life	1 x 10 <sup>6</sup> swit	tching cycles			
Ambient temperature	- 20 t	0 + 55	°C		
Approach speed, max.		20	m/min		
Insertion/extraction force (not locked)	TP3: approx. 10	/ TP4: approx. 15	N		
Retention force when locked	12	200	N		
Weight		ox. 0.5	kg		
Switching element	4131 21	.31 4121			
Contact elements	$2NC \rightarrow +1NO + 1NO \mid 2NC \rightarrow +1$				
Switching principle		n contact element			
Contact material		gold flashed	kV		
Rated impulse withstand voltage U <sub>imp</sub>	TPM: $U_{imp} = 2.5 / TPSR11$ : $U_{imp} = 1.5$				
Rated insulation voltage U <sub>i</sub>	TPM: $U_i = 250 / TPSR11$ : $U_i = 50$				
Utilization category to IEC 947-5-1	TPM: AC-15 l <sub>e</sub> 6 A U <sub>e</sub> 230 V / DC-13 l <sub>e</sub> 6 A U <sub>e</sub> 24 V				
		50 V / DC-13 l <sub>e</sub> 4 A U <sub>e</sub> 24 V			
Switching voltage min. at 10 mA		.2	V		
Switching current min. at 24 V		.0	mA		
Conventional thermal current Ith	,	TPSR11: 4	Α		
Short circuit protection (control circuit fuse)		6 A gG / TPSR11: 4 A gG			
Connection method TPM		nal, M20x1.5			
Connection method TPSR11		ector SR11			
Connection to switching element	Screw terminals, max. cross-section	on of a single connector 1.5 mm <sup>2</sup>	mm <sup>2</sup>		
Solenoid					
Connection		, integrated bridge rectifier			
Solenoid operating voltage		230 V AC (all -15% / +10%)			
Duty cycle	1	00	%		
Power consumption		8	W		
Insertion depth (necessary minimum travel + permissible overtravel)		Overtravel actuator			
Approach direction side (h)	28 + 2	28 + 7	mm		
Approach direction from top (v)	29.5 + 1.5	_	mm		



# **Ordering table**

Series /		Increased			Order No.	
Locking method /	Switching element	over-	Article	Solenoi	d operating	voltage
Connection type	CICILICIIL	travel		024	110	230
TP3M	4131		TP3-4131AM	084 129	084 130	084 131
Mechanical locking,	2131		TP3-231AM	084 142	084 143	084 144
Cable entry	4121	Α	TP3-4121AM	084 135	084 137	084 138
TP4M	4131	(side)	TP4-4131AM	084 132	084 133	084 134
Electrical locking,	2131		TP4-2131AM	084 145	084 147	084 148
Cable entry	4121		TP4-4121AM	084 139	084 140	084 141
TP3SR11	4131		TP3-4131ASR11	088 204		
Mechanical locking,	2131		TP3-2131ASR11	088 205	_	_
Plug connector SR11	4121	Α	TP3-4121ASR11	088 206		
TP4SR11	4131	(side)	TP4-4131ASR11	088 207		
Electrical locking,	2131		TP4-2131ASR11	088 208	_	_
Plug connector SR11	4121		TP4-4121ASR11	088 209		

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

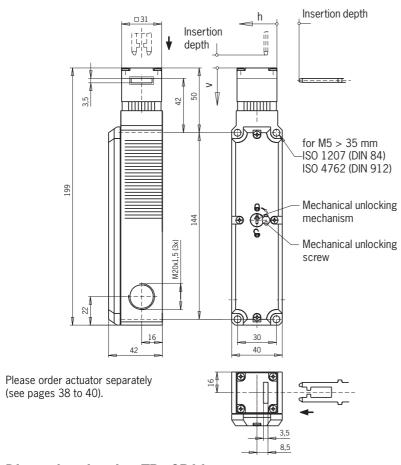
solenoid operating voltage **024** V AC/DC, cable entry **M** 

TP4-4131 A 024 M

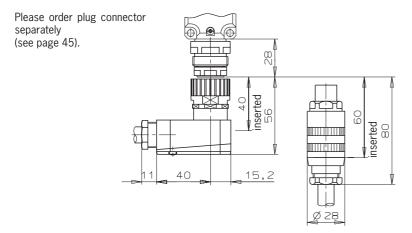
Order No. 084 132

- ► 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)

#### **Dimension drawing TP...M**



#### **Dimension drawing TP...SR11**



#### **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.

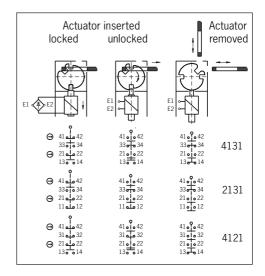


\* with cable entry M, 24 V DC / 110 V AC

#### **Switching elements**

(dependent action contact element)

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



#### **Locking methods**

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

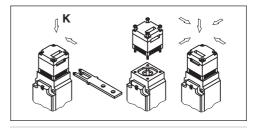
**TP4...:** Lock by applying voltage.

#### **Mechanical unlocking mechanism**

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

#### Changing the approach direction

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

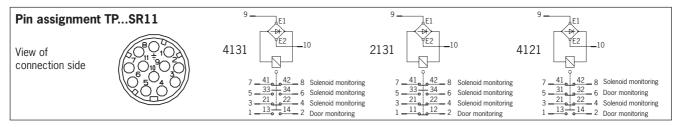


The complete safety switch must be replaced in the event of faults.





Parameters	Value			
Housing material	Glass fiber reinforced thermoplastic			
Degree of protection to IEC 60529	TPM: IP 67 /			
Mounting position	opt			
Mechanical service life	1 x 10 <sup>6</sup> swit	ching cycles		
Ambient temperature	- 20 t	0 + 55	°C	
Approach speed, max.	_	20	m/min	
Insertion/extraction force (not locked)	TP3: approx. 10	/ TP4: approx. 15	N	
Retention force when locked	12	200	N	
Weight		x. 0.5	kg	
Switching element		.31 4121		
Contact elements	$2NC \rightarrow +1NO + 1NO \mid 2NC \rightarrow +1$			
Switching principle		n contact element		
Contact material		gold flashed	kV	
Rated impulse withstand voltage U <sub>imp</sub>	TPM: U <sub>imp</sub> = 2.5 / TPSR11: U <sub>imp</sub> = 1.5			
Rated insulation voltage U <sub>i</sub>	TPM: $U_i = 250 / \text{TPSR}11: U_i = 50$			
Utilization category to IEC 947-5-1	TPM: AC-15 l <sub>e</sub> 6 A U <sub>e</sub> 230 V / DC-13 l <sub>e</sub> 6 A U <sub>e</sub> 24 V			
		50 V / DC-13 I <sub>e</sub> 4 A U <sub>e</sub> 24 V		
Switching voltage min. at 10 mA		.2	V	
Switching current min. at 24 V		.0	mA	
Conventional thermal current Ith	,	TPSR11: 4	Α	
Short circuit protection (control circuit fuse)		6 A gG / TPSR11: 4 A gG		
Connection method TPM		nal, M20x1.5		
Connection method TPSR11		ector SR11		
Connection to switching element	Screw terminals, max. cross-section	on of a single connector 1.5 mm <sup>2</sup>	mm <sup>2</sup>	
Solenoid				
Connection		, integrated bridge rectifier		
Solenoid operating voltage		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	



# **Ordering table**

Series /	Switching	Increased			Order No.	
Locking method /	element	over-	Article	Solenoi	d operating	voltage
Connection type	CICILICIIL	travel		024	110	230
TP3M	4131		TP3-4131KM	084 256	084 257	084 258
Mechanical locking,	2131		TP3-2131KM	084 264		084 265
Cable entry	4121	K	TP3-4121KM	084 260		084 262
TP4M	4131	(side + top)	TP4-4131KM	084 259	on request	
Electrical locking,	2131		TP4-2131KM	084 266		on request
Cable entry	4121		TP4-4121KM	084 263		
TP3SR11	4131		TP3-4131KSR11	088 219		
Mechanical locking,	2131		TP3-2131KSR11	088 220		
Plug connector SR11	4121	K	TP3-4121KSR11	088 221		
TP4SR11	4131	(side + top)	TP4-4131KSR11	088 222	_ <u>-</u>	_
Electrical locking,	2131		TP4-2131KSR11	088 223		
Plug connector SR11	4121		TP4-4121KSR11	088 224	1	

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

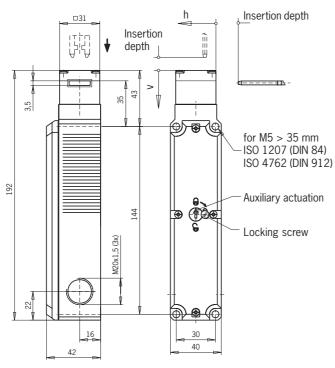
top K, solenoid operating voltage O24 V AC/DC, cable entry M

TP4-4131 K 024 M

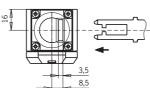
Order No. 084 259

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

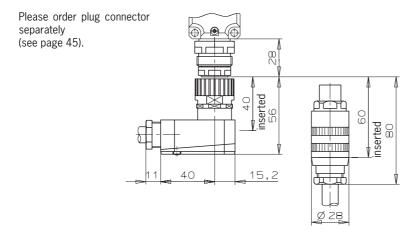
#### Dimension drawing TP...M



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



#### **Dimension drawing TP...SR11**



#### **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**

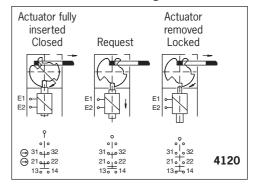
(dependent action contact element)

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

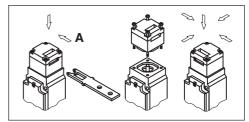
The unlock request contact 21-22 is operated if the door together with the actuator is moved slightly away from its closed position. This action opens the 21-22 contact, which can then be used via the PLC to unlock the solenoid. The door can then be opened in the normal way. This procedure ensures that 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  $90^\circ$  increment. The standard setting is approach direction A.



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



Parameter	Va	lue	Unit		
Housing material	Glass fiber reinfo	Glass fiber reinforced thermoplastic			
Degree of protection to IEC 60529	TPM: IP 67 /	TPM: IP 67 / TPSR11: IP 65			
Mounting position	opt	ional			
Mechanical service life	5 x 10⁵ swi	tching cycles			
Ambient temperature	- 20 t	0 + 55	°C		
Approach speed, max.	2	20	m/min		
Insertion/extraction force (not locked)	аррі	rox. 8	N		
Retention force when locked	8	00	N		
Weight	appro	ox. 0.5	kg		
Switching element	41	120			
Contact elements	1 NC → + 1	$NC \rightarrow + 1 NO$			
Switching principle		n contact element			
Contact material		gold flashed			
Rated impulse withstand voltage U <sub>imp</sub>		TPSR11: U <sub>imp</sub> = 1.5	kV		
Rated insulation voltage U <sub>i</sub>	TPM: $U_i = 250 / \text{TPSR}11: U_i = 50$		V≅		
Utilization category to IEC 947-5-1		30 V / DC-13 I <sub>e</sub> 6 A U <sub>e</sub> 24 V			
	TPSR11: AC-15 l <sub>e</sub> 4 A U <sub>e</sub>	50 V / DC-13 l <sub>e</sub> 4 A U <sub>e</sub> 24 V			
Switching voltage min. at 10 mA	1	12	V		
Switching current min. at 24 V	1	10	mA		
Conventional thermal current Ith	,	TPSR11: 4	Α		
Short circuit protection (control circuit fuse)		6 A gG / TPSR11: 4 A gG			
Connection method TPM		nal, M20x1.5			
Connection method TPSR11		ector SR11			
Connection to switching element	Screw terminals, max. cross-section	on of a single connector 1.5 mm <sup>2</sup>	mm <sup>2</sup>		
Solenoid					
Connection		, integrated bridge rectifier			
Solenoid operating voltage		230 V AC (all -15% / +10%)			
Duty cycle	1	00	%		
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		



# **Ordering table**

•						
Series / Locking method /	Switching element	Increased over-	Article	Solenoi	Order No. d operating	
Connection type	Cicincii	travel		024	110	230
TP5M						
Mechanical locking,			TP5-4120AM	084 279		
Cable entry	4100	Α			on vogueet	
TP6M	4120	(side)			on request	on request
Electrical locking,			TP6-4120AM	084 280		
Cable entry						
TP5SR11						
Mechanical locking,			TP5-4120ASR11			
Plug connector SR11	4100	Α		l		
TP6SR11	4120	(side)		on request	on request	on request
Electrical locking,			TP6-4120ASR11			
Plug connector SR11						

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

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

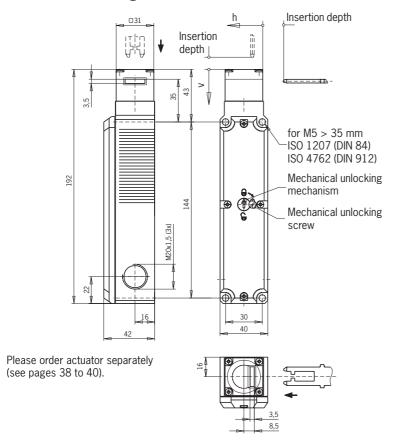
TP6-4120 A 024 M

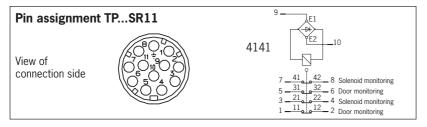
Order No. 084 280



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

#### Dimension drawing TP...M







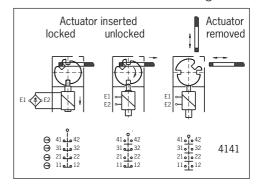
#### **Technical data**

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

#### **Switching elements**

(dependent action contact element)

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).

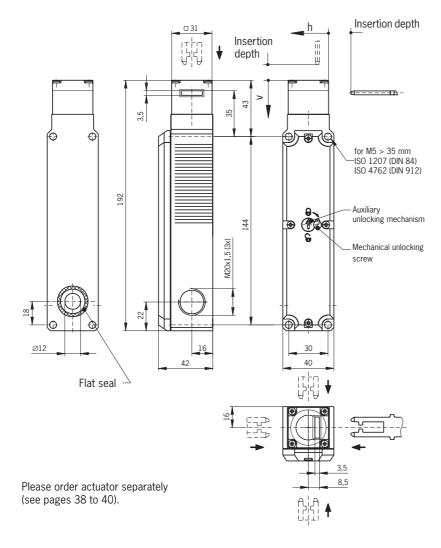
#### **Ordering table**

Series /	Switching	Increased		Order No.
Locking method /	element	over-	Article	Solenoid operating voltage
Connection type	Ciciliciit	travel		024
TP3M				
Mechanical locking,			TP3-4141A024M	084 270
Cable entry				
TP4M				
Electrical locking,			TP4-4141A024M	084 275
Cable entry	4141	Α		
TP3SR11	4141	(seitlich)		
Mechanical locking,			TP3-4141A024SR11	088 922
Plug connector SR11				
TP4SR11				
Electrical locking,			TP4-4141A024SR11	088 923
Plug connector SR11				



- ▶ 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



#### Technical data

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

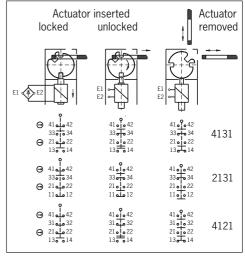
#### **Deviation from standard**

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
TP3M  Mechanical locking,  Cable entry	2131	<b>A</b> (side)	TP3-2131A024M C1761	084 290

Ordering example: TP3, Mech. locking, switching element 2131, increased overtravel side A,

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

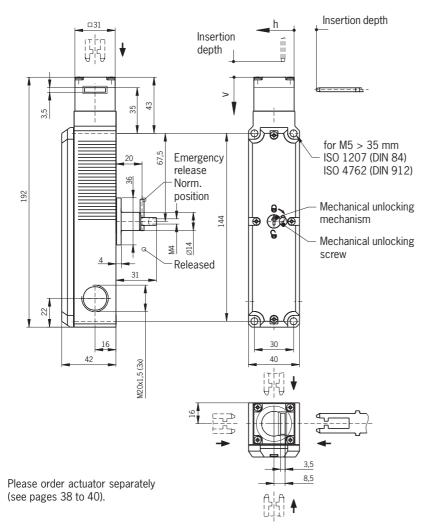
TP3-2131 A 024 M C1761

Order No. 084 290



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

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





\* Approval with switching element 4141 pending

#### **Technical data**

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

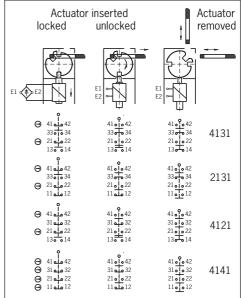
#### **Deviation from standard**

► 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.

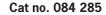
# Ordering table (further types available on request)

Series / Locking method / Connection type	Switching element	Increased over- travel	Article	Order No. Solenoid operating voltage 024
TP3M	2131	Α	TP3-2131A024M C1743	084 285
Mechanical locking,	4121		TP3-4121A024M C1743	087 427
Cable entry	4141	(side)	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

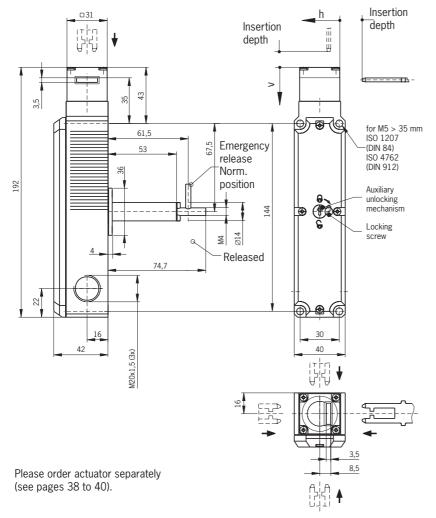






- ▶ Emergency release through the rear mounting face
- ► Long actuation axis
- ▶ With 4 contact elements, with door monitoring contact
- ► Cable entry M20 x 1.5

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



#### 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).

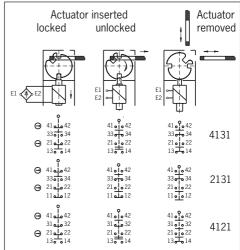
#### **Switching elements**

(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
TP3M  Mechanical locking,  Cable entry	2131	<b>A</b> (side)	TP3-2131A024M C1993	087 400

Ordering example: TP3, Mech. locking, switching element 2131, increased overtravel side A,

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

TP3-2131 A 024 M C1993

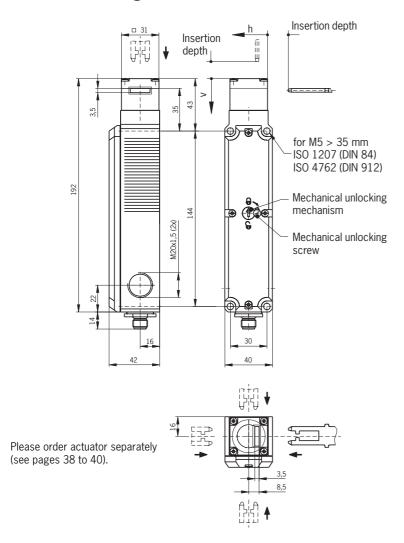
Cat no. 087 400

# **EUCHNER**

#### 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)

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



#### **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.



\* Approval pending

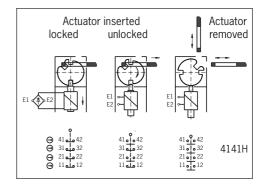
#### **Deviation from standard**

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

# **Switching elements**

(dependent action contact element)

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



#### Locking methods

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

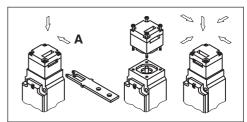
TP4...: Lock by applying voltage.

# 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

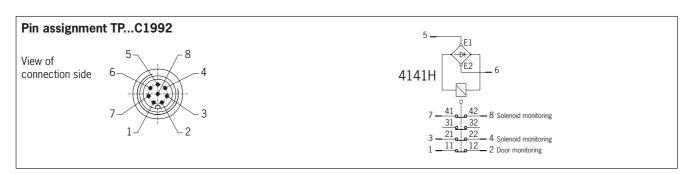
Upon removal of the actuator head fixing screws, the approach direction can be changed to any 90° increment. The standard setting is approach direction A.



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



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° 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	$2 \text{ NC} \ominus + 2 \text{ NC} \ominus$		
Switching principle	Dependent action contact element		
Contact material	silver alloy, gold flashed		
Rated impulse withstand voltage U <sub>imp</sub>	1,5 30		kV
Rated insulation voltage U <sub>i</sub>			V≅
Utilization category to IEC 947-5-1	AC-15 l <sub>e</sub> 1 A U <sub>e</sub> 24 V / DC-13 l <sub>e</sub> 1 A U <sub>e</sub> 24 V		
Switching voltage min. at 10 mA	12		V
Switching current min. at 24 V	1		mA
Conventional thermal current I <sub>th</sub>	1		Α
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 <sup>2</sup>		mm <sup>2</sup>
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



# Ordering table (further types available on request)

Series / Locking method / Connection type	Switching element	Increased over- travel	Article _	Order No. Solenoid operating voltage 024
TP3M  Mechanical locking, M12 plug connector	4141H	A (side)	TP3-4141HA024SM8 C1992	087 377
TP4M 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

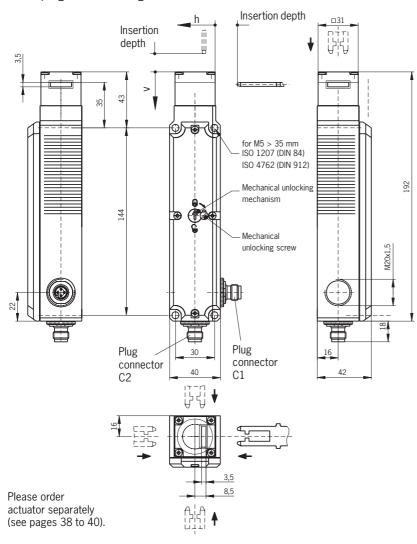
TP3-4141H A 024 SM8 C1992

Order No. 087 377

- ► 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)



# 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.

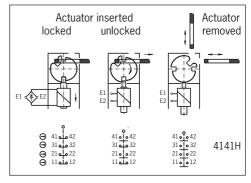
#### **Deviation from standard**

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

#### **Switching elements**

(dependent action contact element)

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



# Locking methods

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

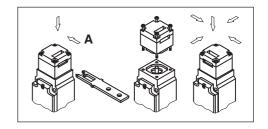
**TP4...:** Lock by applying voltage.

#### Mechanical unlocking mechanism

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

#### Changing the approach direction

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

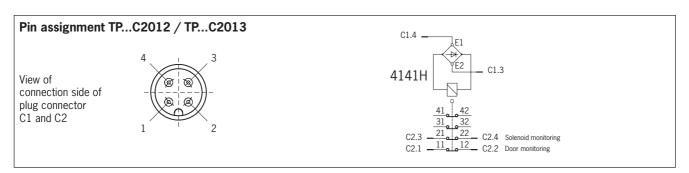


The complete safety switch must be replaced in the event of faults.



#### **Technical data**

Parameters	Va	lue	Unit
Housing material	Glass fiber reinforced thermoplastic		
Degree of protection to IEC 60529	IP 67		
Mounting position		ional	
Mechanical service life		tching cycles	
Ambient temperature		0 + 55	°C
Approach speed, max.	2	20	m/min
Insertion/extraction force (not locked)		ox. 10	N
Retention force when locked		200	N
Weight	appro	ox. 0.5	kg
Switching element		41H	
Contact elements	2 NC ⊖	+ 2 NC →	
Switching principle	•	n contact element	
Contact material	silver alloy, gold flashed		
Rated impulse withstand voltage U <sub>imp</sub>	2.5		kV
Rated insulation voltage U <sub>i</sub>	250		V≅
Utilization category to IEC 947-5-1	AC-15 l <sub>e</sub> 1.5 A U <sub>e</sub> 230 V / DC-13 l <sub>e</sub> 1.5 A U <sub>e</sub> 24 V		
Switching voltage min. at 10 mA	12		V
Switching current min. at 24 V	1		mA
Conventional thermal current Ith	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 <sup>2</sup>		mm <sup>2</sup>
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



## Ordering table (further types available on request)

Series / Locking method / Connection type	Switching element	Increased over- travel	Article	Order No. Solenoid operating voltage 024
TP3C2012 Mechanical locking, M12 plug connector left			TP3-4141HA024SM4C2012	087 425
TP4C2012 Electrical locking, M12 plug connector left	4141H	<b>A</b> (seitlich)	TP4-4141HA024SM4C2012	092 772
TP3C2013 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

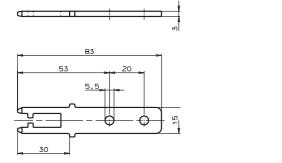
## **Accessories**

## **Standard actuators**

#### Straight actuator

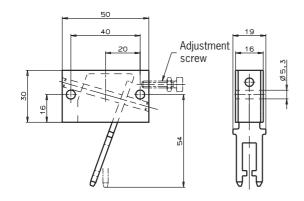
(incl. 2 safety screws M5x10)

Article	Order No.
Actuator-P-G	059 226



Min. door radius 1000 mm

## Hinged actuator for top and bottom hinged doors (incl. 2 safety screws M5x25)



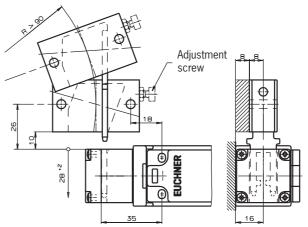
Min. door radius 90 mm

## Bent actuator

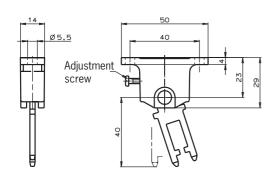
(incl. 2 safety screws M5x10)

Article		Order No.
Actuator-P-W		059 227
42	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
30	Min. door radius 1000 mr	n

Article	Order No.
Hinged actuator P-OU	070 050
299	



# Hinged actuator for right and left hinged doors (incl. 2 safety screws M5x10)



Min. door radius 100 mm

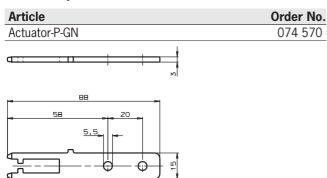
Article	Order No.
Hinged actuator P-LR	059 440
Adjustment screw	***************************************



#### **Overtravel actuators**

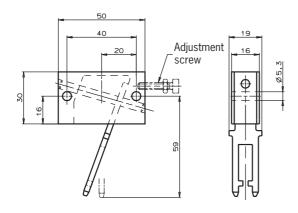
#### Straight actuator

(incl. 2 safety screws M5x10)



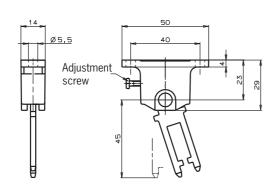
Min. door radius 1000 mm

# **Hinged actuator for top and bottom hinged doors** (incl. 2 safety screws M5x25)



Min. door radius 90 mm

# Hinged actuator for right and left hinged doors (incl. 2 safety screws M5x10)



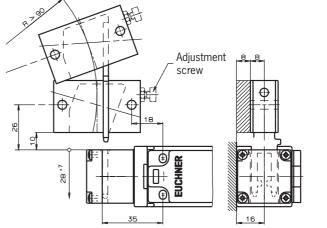
Min. door radius 100 mm

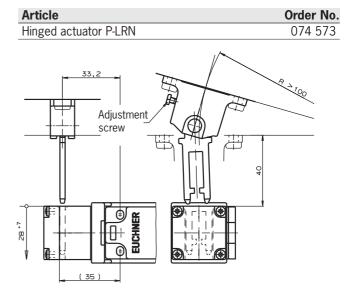
#### **Bent actuator**

(incl. 2 safety screws M5x10)

Article		Order No.
Actuator-P-WN		074 571
47	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	
<del></del>		
35	Min. door radius 1000 mm	1

Article	Order No.
Hinged actuator P-OUN	074 572
979	



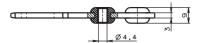


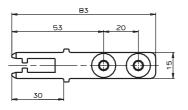
#### Standard actuators with rubber bush

### **Straight actuator**

(incl. 2 safety screws M4x14)

# Article Order No. Actuator-P-GT 070 046



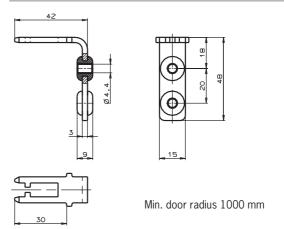


Min. door radius 1000 mm

#### **Bent actuator**

(incl. 2 safety screws M4x14)

Article	Order No.
Actuator-P-WT	070 038

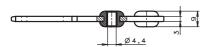


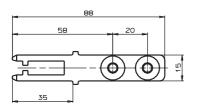
## Overtravel actuators with rubber bush

#### **Straight actuator**

(incl. 2 safety screws M4x14)

Article	Order No.
Actuator-P-GNT	074 576



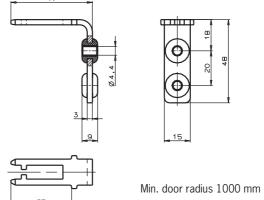


Min. door radius 1000 mm

### **Bent actuator**

(incl. 2 safety screws M4x14)

Article	Order No.
Actuator-P-WNT	074 577
47	

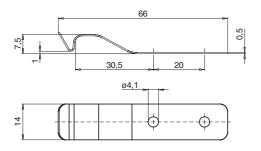




### Latch spring for increased retention force

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

# Article Order No. Latch spring NP/TP 076 501

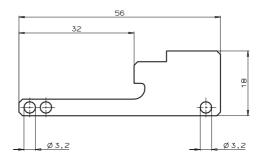


#### **Notes**

- ► 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)

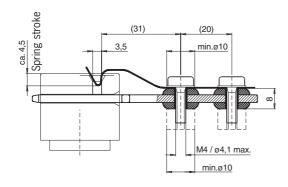
## Lockout bar

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.

#### Installation example



#### Safety screws

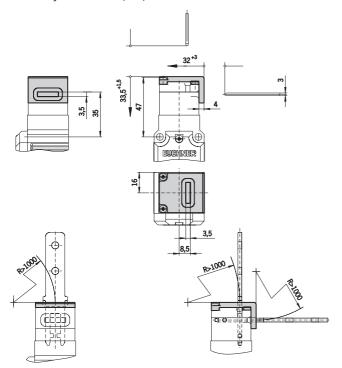
Screw type	Use	Packaging unit	Article	Order No.
M5x10 Material stainless steel	<ul> <li>for straight actuator</li> <li>for bent actuator</li> <li>for hinged actuators for right and left hinged doors</li> </ul>	100 pieces	M5x10/V100	086 231
M5x25 For hinged actuators for t and bottom hinged doors		100 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 NPA, GP and TPA	100 pieces	3x30/V100	075 532

### Replacement screws (not safety screws)

Screw type	Use	Packaging unit	Article	Order No.
3x30	for actuation heads			
self-tapping screw (plastite)	NPA, GP and TPA	100 pieces	3x30/V100	082 237
Material stainless steel				
3x38	for actuation heads	100 pieces	3x38/V100	076 755
self-tapping screw (plastite)	NPK, TPK	100 pieces	3x30/ \100	070 755

#### 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.

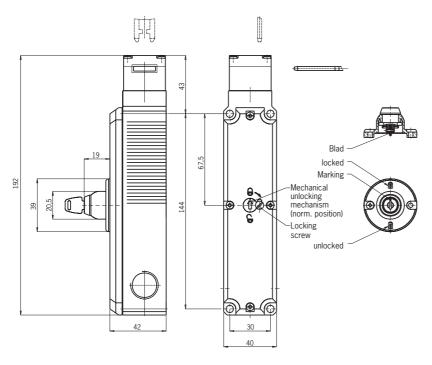
M3x34 self-tapping screws (plastite, supplied) are used to secure it to the actuation head.

#### **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**

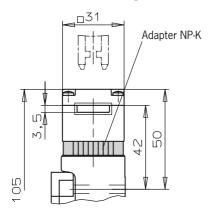
- ▶ Please order TP safety switch separately
- 2 keys are included
- All TP safety switches can be retrofitted with the key release

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

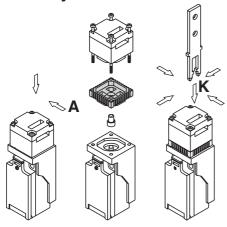


## Adapter NP-K for safety switch NP

## **Dimension drawing**

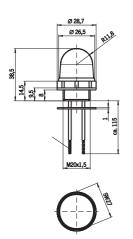


## **Assembly**



### **Built-in LED**

## **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

## **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		

Article	Order No.
Built-in LED	087 423

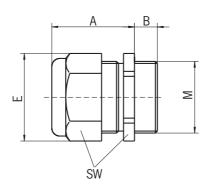


## Cable glands (plastic)

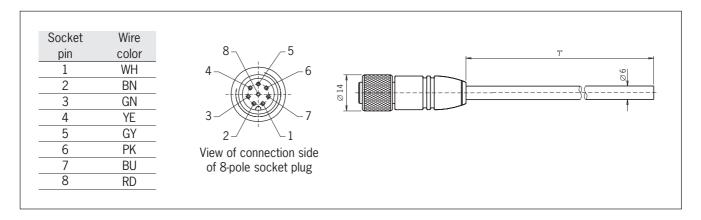
The cable gland table below shows the cable diameter and the dimensions used with the EUCHNER NP...M, GM..M and TP...M safety switches.

M	Outer cable diameter D	Α	В	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



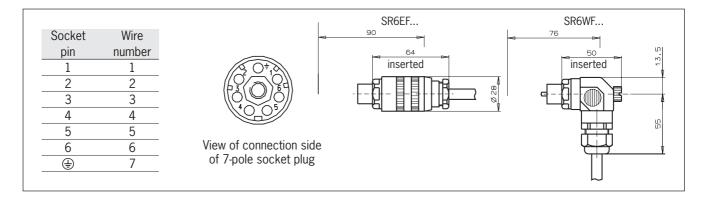
## **Technical data**

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

Cable length "I"	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



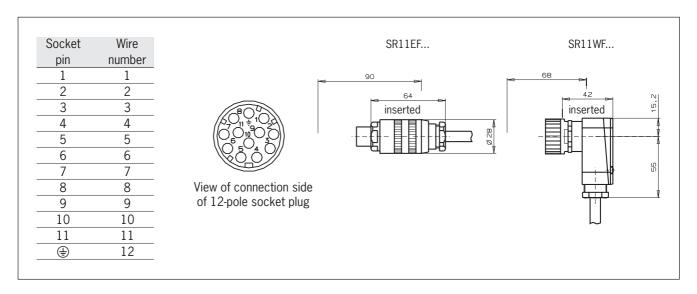
## **Technical data**

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	Ø8 mm
Wire cross-section	1.0 mm <sup>2</sup>
wire cross-section	1.0 mm²

## Ordering table

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

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



#### **Technical data**

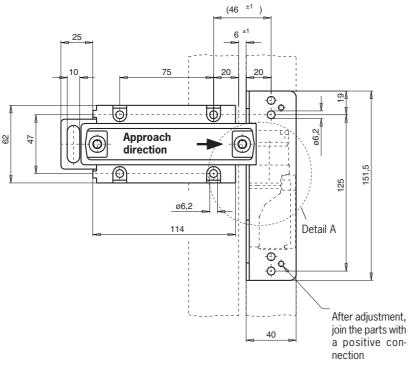
Parameters	Value
Housing material	plastic
Number of poles	11 + PE
Nominal voltage	50 V≅
Degree of protection to IEC 60,529	IP65 /inserted)
Connection cable	PUR grey
Outer diameter	Ø 10.5 mm
Wire cross-section	1.0 mm <sup>2</sup>

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

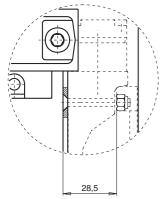
#### **Bolt NP**

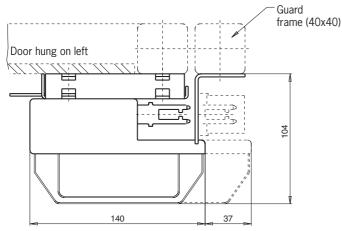
► For NP...AS safety switches

## **Dimension drawing**Bolt NP for right or left hinged doors



#### **Detail A**







#### **Characteristics**

- Easy screw fitting to both aluminum extruded profiles and machine guards
- Distinctive yellow color for easy recognition
- Symmetrical design for right-hinged or lefthinged 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**

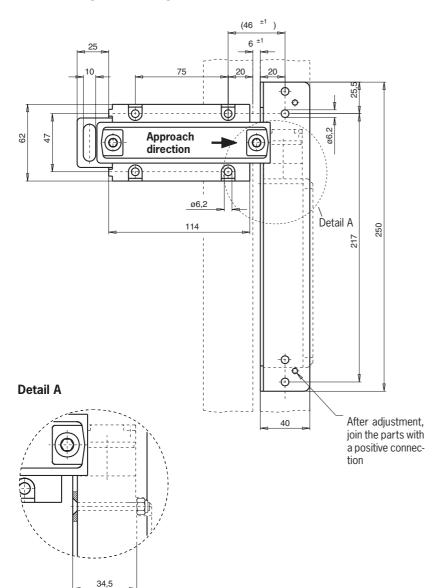
- Only NP...AS can be mounted on the switch bracket NP.
- Actuator included
- Please order safety switch and switch bracket separately

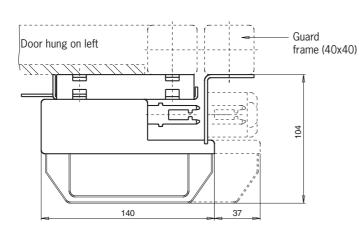
Article	Order No.
Bolt O NP/TP	072.525
without snap-in function	073 535
Bolt 1 NP/TP	
with snap-in mechanism,	073 536
1 x snap-in function closed	
Switch bracket NP	073 538

## **Bolt TP**

► For GP... and TP...A safety switches

## **Dimension drawing**Bolt TP for right or left hinged doors







#### **Characteristics**

- Easily installed to both aluminum extruded profiles and machine guards
- ▶ Distinctive yellow color for easy recognition
- Symmetrical design for right-hinged or lefthinged 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

0.008	
Article	Order No.
Bolt O NP/TP	072 525
without snap-in function	073 535
Bolt 1 NP/TP	
with snap-in function,	073 536
1 x snap-in function closed	
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.

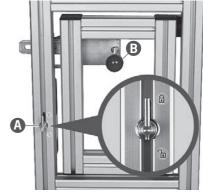


Fig. 1: Safety switch with bolt (rear view)

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.

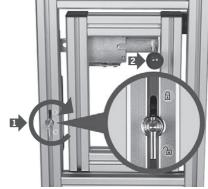


Fig. 2: Emergency release with lever activated

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.

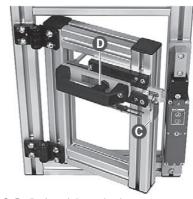


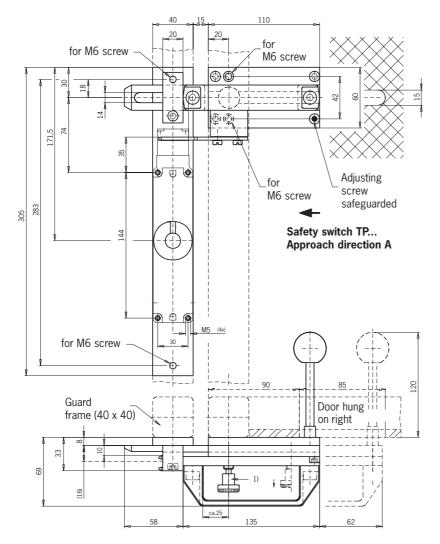
Fig. 3: Padlock and detent knob

#### **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



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

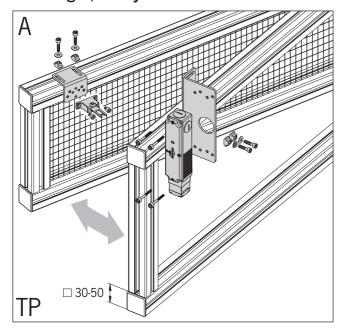
Article	Order No.
Bolt TP-AF	
(with emergency release)	086 186
for right hinged doors	
Bolt TP-CF	
(with emergency release)	086 188
for left hinged doors	
Bolt TP-A	
(without emergency release)	084 430
for right hinged doors	
Bolt TP-C	
(without emergency release)	084 432
for left hinged doors	



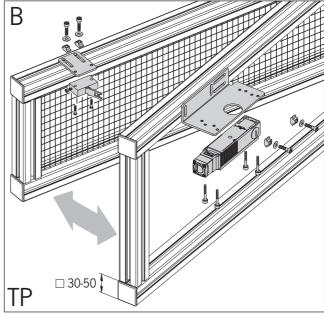
## Mounting plates EMP for TP...A Safety Switches

Switch	Switch mounting type	Switch mounting plate	Actuator mounting plate	Actuator see page 38 - 40	Minimum distance hinged actuator to switch
TPA	A	<b>EMP-SB</b> Order No. 093 456	<b>EMP-B1</b> Order No. 093 457	Order No. 070 038 074 577 Angle actuator	> 1000 mm
	vertical	83 83 85 85 87 88x)	M5 (4x) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Order No. 059 440 074 573	> 100 mm
	<b>B</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

Article	Order No. Page	Article	Order No. Page
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