

# Emergency Stop Devices/ Rope Pull Switches



**EUCNER**

More than safety.

# EUCHNER

More than safety.



Headquarters in Leinfelden-Echterdingen



Logistics center in Leinfelden-Echterdingen



Production location in Unterböhringen

## Internationally successful – the EUCHNER company

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

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

16 subsidiaries and other sales partners in Germany and abroad work for our international success on the market.

## Quality and innovation – the EUCHNER products

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

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

We define future safety technology with the highest quality standards and reliable technology. Extraordinary solutions ensure the great satisfaction of our customers.

The product ranges are subdivided as follows:

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



## Emergency Stop Devices/Rope Pull Switches

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## Emergency stop devices ES...

As per EN ISO 13850 the emergency stop function is a function that is intended to avert an impending hazard for personnel, damage to the machine or work in progress, or to alleviate existing hazards, and that is to be triggered by a single user action.

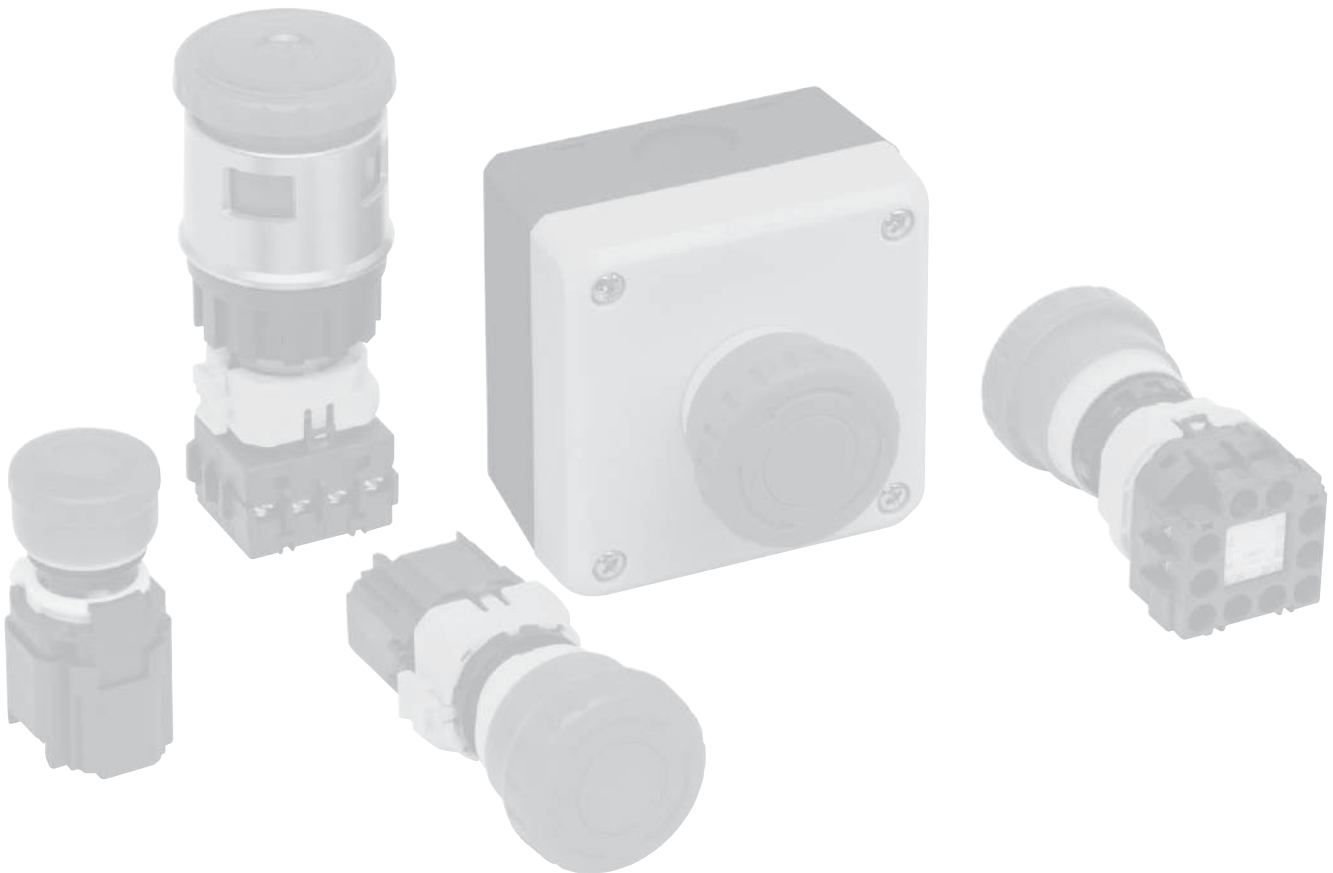
For this purpose controlgear is required that is equipped with a red actuator, that is the mushroom-head button in red; the button is to have a yellow background. The emergency stop function is generally only allowed to provide safety in addition to the directly acting safety functions. Directly acting safety functions are, for example, safety switches on safety doors that cause a hazard to be shut down without conscious action by the user.

EUCHNER emergency stop controlgear features very innovative technology.

Most controls ES... have contact block monitoring to check whether the switching elements fitted are actually all correctly seated in the switch. If the switching elements should come loose unintentionally, an emergency stop command is triggered automatically.

The controls ES-XN.. have a protective collar that makes it possible to fit a padlock when the mushroom-head button is pressed. As a result it is not possible to pull the control back out. This measure is used to provide personnel who must work in the danger area inside a machine with simple and effective protection against inadvertent power up of the machine.

The reset mechanism on the EUCHNER emergency stop controlgear is very sophisticated. The majority of buttons can be reset by either turning or pulling. And this feature is not an option, but in general standard.





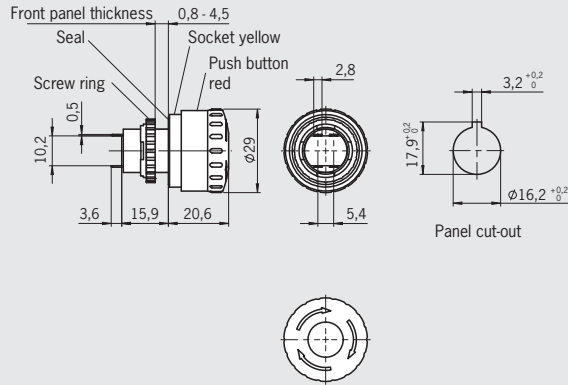
## Emergency stop devices ES...



- ▶ Built-in devices 16 mm
- ▶ Button head red  $\varnothing$  29 mm
- ▶ Reset by pulling or turning
- ▶ Short design

### Emergency stop device ES-XA...

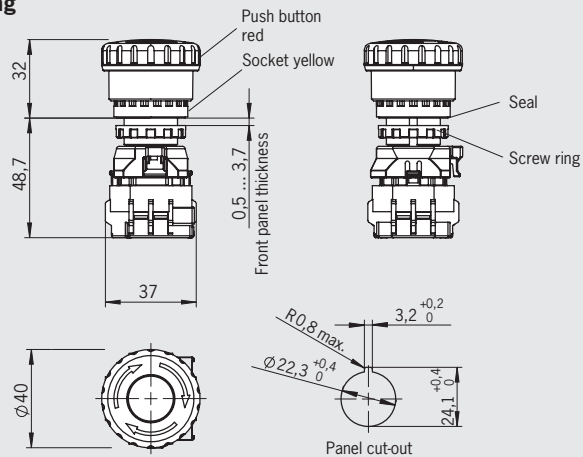
#### Dimension drawing



- ▶ Built-in devices 22 mm
- ▶ Button head red  $\varnothing$  40 mm
- ▶ Contact block monitoring
- ▶ Reset by pulling or turning
- ▶ Optionally with built-in LED

### Emergency stop device ES-XW...

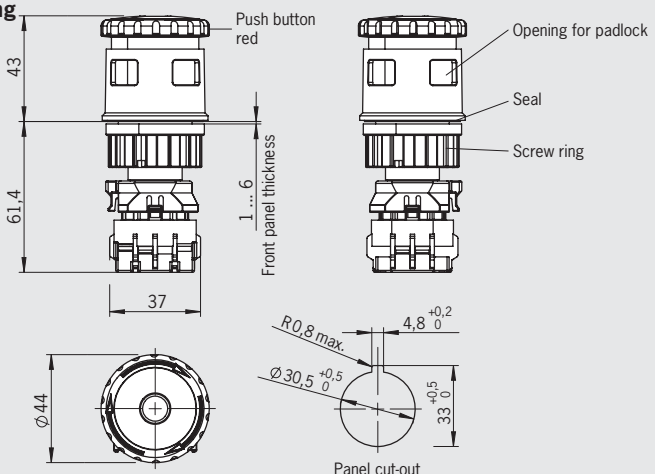
#### Dimension drawing



- ▶ Built-in devices 30 mm
- ▶ Button head red  $\varnothing$  44 mm
- ▶ Contact block monitoring
- ▶ Can be locked using padlock
- ▶ Reset by turning
- ▶ Optionally with built-in LED

### Emergency stop device ES-XN...

#### Dimension drawing

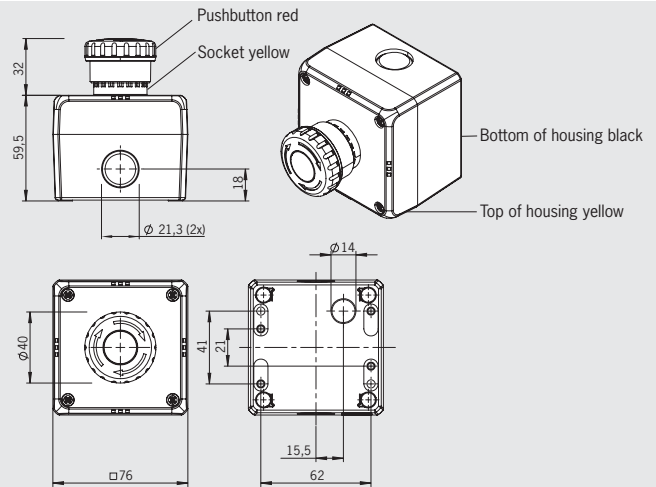




- ▶ Devices with housing
- ▶ Button head red Ø 40 mm
- ▶ Contact block monitoring
- ▶ Reset by pulling or turning
- ▶ Housing
- ▶ Optionally with built-in LED

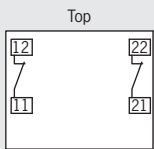
## Emergency stop device ES-FB...XW...

### Dimension drawing

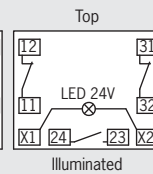
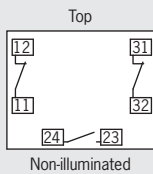


### Switching functions

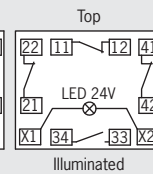
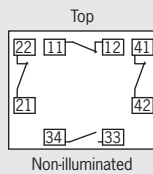
#### 2 NC



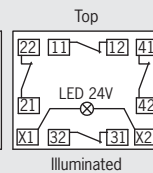
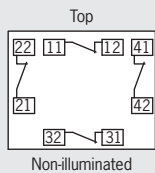
#### 2 NC + 1 NO



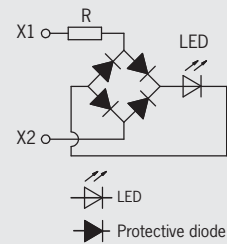
#### 3 NC + 1 NO



#### 4 NC



### LED wiring diagram



### Ordering table

Series	Switching elements	Connection	Lighting	Mushroom-head button	Order No./item
<b>ES-XA</b> (built in, 16 mm)	2 NC ⊖	Soldered connection	<b>BV</b> without	<b>3U02R</b> 29 mm, red	<b>106435</b> ES-XA1E-BV3U02R
<b>ES-XW</b> (built in, 22 mm)	2 NC ⊖ + 1 NO	Screw terminal	<b>BV</b> without	<b>412MFR</b> 40 mm, red	<b>105013</b> ES-XW1E-BV412MFR
			<b>LV</b> with	<b>412Q4MFR</b> 40 mm, red transparent	<b>105014</b> ES-XW1E-LV412Q4MFR
	4 NC ⊖	Screw terminal	<b>BV</b> without	<b>404MFR</b> 40 mm, red	<b>113893</b> ES-XW1E-BV404MFR
			<b>LV</b> with	<b>404Q4MFR</b> 40 mm, red transparent	<b>114354</b> ES-XW1E-LV404Q4MFR
<b>ES-FB...XW</b> (housing)	2 NC ⊖ + 1 NO	Screw terminal	<b>BV</b> without	<b>412MFR</b> 40 mm, red	<b>105017</b> ES-FB1W-XW1E-BV412MFR-YO
			<b>LV</b> with	<b>412Q4MFR</b> 40 mm, red transparent	<b>105018</b> ES-FB1W-XW1E-LV412Q4MFR-YO
<b>ES-XN</b> (built in, 30 mm)	2 NC ⊖ + 1 NO	Screw terminal	<b>BL</b> without	<b>412MFRH</b> 44 mm, red	<b>105015</b> ES-XN4E-BL412MFRH
			<b>LL</b> with	<b>412Q4MFR</b> 44 mm, red transparent	<b>105016</b> ES-XN4E-LL412Q4MFR
	3 NC ⊖ + 1 NO	Screw terminal	<b>BL</b> without	<b>413MFRH</b> 44 mm, red	<b>124713</b> ES-XN4E-BL413MFRH
			<b>LL</b> with	<b>413Q4MFR</b> 44 mm, red transparent	<b>124712</b> ES-XN4E-LL413Q4MFR

## Accessories for emergency stop devices ES...

### Ordering table

Series	Designation	Order No./item
ES-MW9Z-T1	Key for fastening the ring screw on ES-XW devices	106337
ES-MT-001	Key for fastening the ring screw on ES-XA devices	106339
ES-XN9Z-T1	Key for fastening the ring screw on ES-XN devices	106338
ES-HWAV-27	Emergency stop plate for 40 mm buttons on ES-XW devices with text "Emergency Stop"	106340
ES-HAAV-27	Emergency stop plate for 29 mm buttons on ES-XA devices with text "Emergency Stop"	106342
ES-HNAV-27	Emergency stop plate for 40 mm buttons on ES-XN devices with text "Emergency Stop"	106341

## Technical data of emergency stop devices ES...

### Reliability values according to EN ISO 13849-1

Parameter	Value	Unit
B <sub>10d</sub>	1 x 10 <sup>9</sup> operating cycles	

Parameter		Value		Unit
		Non-illuminated	Illuminated	
Material	Button Housing	Reinforced thermoplastic Polycarbonate		
Mechanical life		250,000 operating cycles		
Ambient temperature		- 25 ... + 60	- 25 ... + 55	°C
Storage temperature		- 45 ... + 80		°C
Degree of protection acc. to EN IEC 60529				
- ES-XA... (button)		IP 65		
- ES-XW... / ES-XN... (button)		IP 20		
- ES-FB...XW... (housing)		IP 65		
Connection				
- ES-XA...		Soldered connection		
- ES-XW... / ES-XN... / ES-FB...XW...		Screw terminal		
Contact material		Silver alloy, gold flashed		
Positively driven		According to EN 60947-5-1		
Rated insulation voltage U <sub>i</sub>		250		V
Utilization category according to EN 60947-5-1				
- ES-XA...		DC-13 3 A 24 V		
- ES-XW... / ES-XN... / ES-FB...XW...		AC-15 1.5 A 250 V (NO contact AC-14 0.3 A 250 V) DC-13 1 A 30 V		
Conventional continuous thermal current I <sub>th</sub>		1		A
Switching current, min., at 24 V		10		mA
<b>Lighting data</b>				
Operating voltage	-	24 ± 10%		V AC/DC
Operating current	-	15		mA





## Rope pull switches

In the field of safety engineering, rope pull switches belong to the category of “Emergency stop devices with mechanical latching” according to EN ISO 13850. The required emergency stop function must be available and functional at all times irrespective of the operating mode. After operation of the actuating element, the emergency stop device must automatically prevent or reduce the hazard in the best possible way.



### Type examinations

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

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

Furthermore, many items of switchgear are listed by the Canadian Standards Association (CSA). These switches can be used in countries in which this listing is required. The approval symbols on the individual pages of the catalog indicate which body tested the switches.

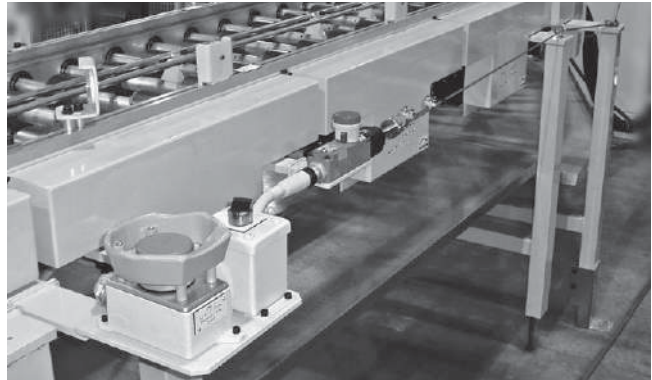
With the aid of the approval symbols listed below you can quickly see which approvals are available for the related switches:

	<p>Switches with this symbol have the approval of the German Social Accident Insurance association (DGUV) – formerly the employers' liability insurance association (BG)</p>
	<p>Switches with this symbol are approved by Canadian Standards Association (CSA, Canada and USA).</p>

### Task of rope pull switches

The trip range is much larger than for switches with an emergency stop pushbutton, since operation is possible over the whole rope length and is not restricted to the small area within reach of the switch.

Rope pull switches are used whenever it is necessary to protect large danger areas where it is not possible or too complex to fit a housing or cover.



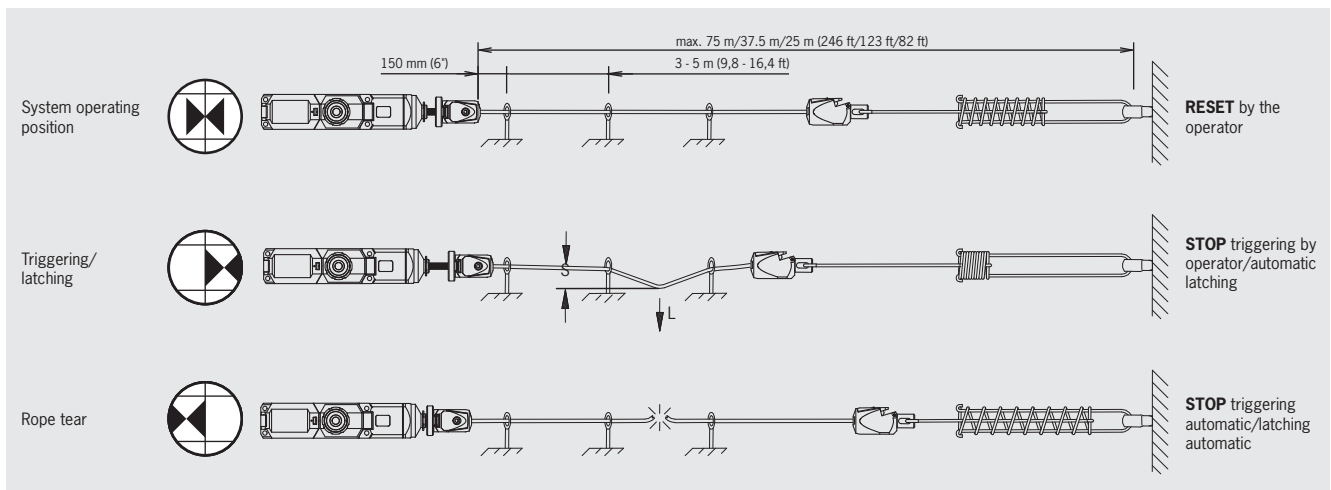
The advantage is that areas of an installation or machine can be shut down immediately from any point in the working area in the event of danger in cases where it would otherwise be necessary to install individual latched emergency stop buttons at short distances apart.

### Function and technology used in rope pull switches

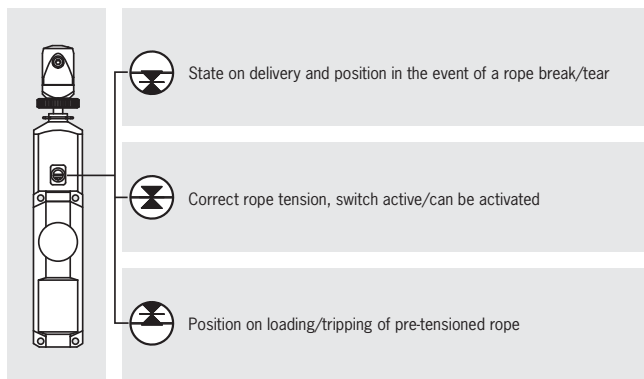
The standard EN 60947-5-5 – 6 (requirements for emergency stop push-buttons and rope pull switches) specifies certain requirements which must be met by rope pull switches and which therefore also define the mode of operation of such switches.

As such the latching device (emergency stop switch) must be reset by turning a key, by turning the pushbutton in the stated direction or by pulling. Rope pull switches are normally tripped by pulling a plastic-sheathed steel rope (known as the safety rope or pull rope). In addition, most EUCHNER rope pull switches feature a latched emergency stop button on the housing which has the same effect.

Upon tripping, the safety contacts are actuated and a stop signal is generated to switch off the machine. The vertical tensile force which acts on the wire or rope to generate the emergency stop signal (contact opening) must be less than 200 N and the vertical deflection of the wire or rope which is necessary for generation of the emergency stop signal must be less than 400 mm. An emergency stop signal must also be generated if the wire or rope breaks or becomes detached. This means that any fault in the safety device is noticed immediately and the safety function is not lost at any time.



In order to achieve this, the rope pull switch has one center position and two switch-off positions. The switch is in center position during machine operation. If the safety rope is pulled or breaks, the switch moves from the center position to one of the switch-off positions and the machine is stopped. Rope pull switches from EUCHNER have a window which allows the switch position to be seen.



## Installation and rope attachment

### Installation

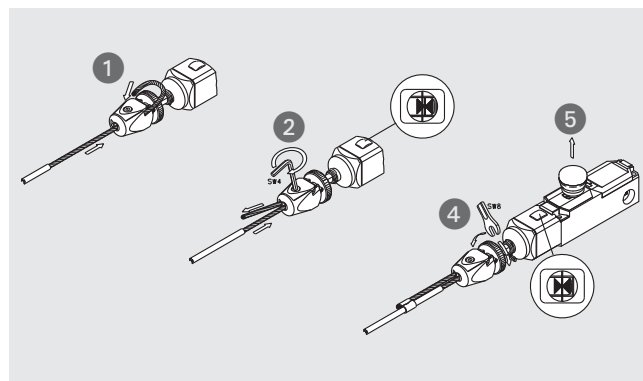
In accordance with EN ISO 13850:2008 – 4.4, emergency stop pushbuttons must be installed so that they can be reached easily and operated safely by persons who are at risk. It may be useful to attach marking flags to improve visibility if wires/wire ropes or ropes are used, as is the case with rope pull switches.

A tensioner spring must be installed on the counter bearing in order to ensure proper and safety-compliant implementation of the rope pull system. This is a precondition for direction-independent tripping at any point along the rope length.

### Rope attachment

► Versions RPS...SC and RPS...PC

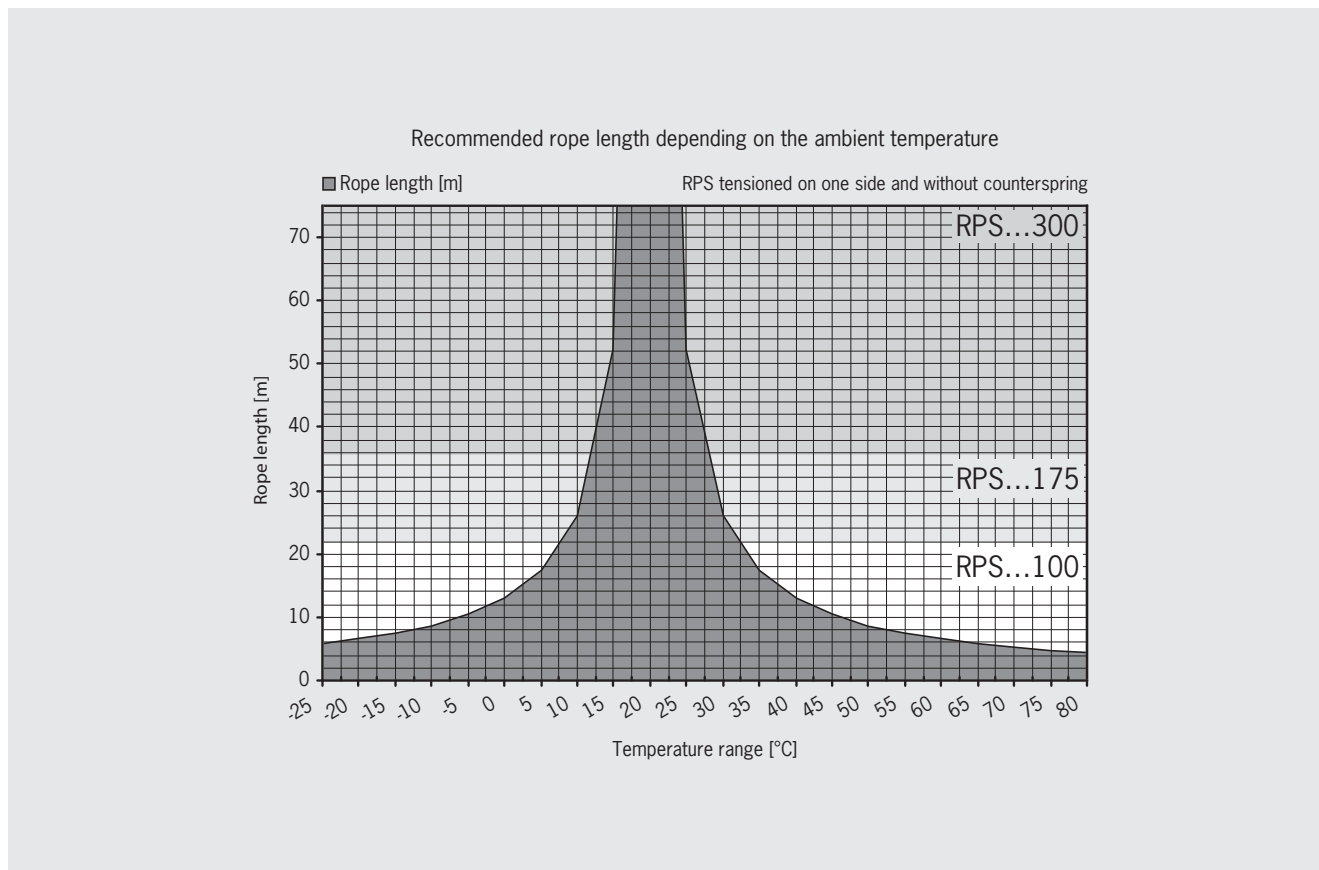
- 1 Strip the pull rope and insert into the clamping head. In order to prevent the pull rope from slipping, there must be no rope coating in the clamping head.
- 2 Set the pull rope so that the lock marking is in central position and clamp the pull rope with the hexagon socket head screw.
- 3 Actuate the pull rope hard several times in order to stretch the rope and then readjust the rope using the clamping head.
- 4 Set the lock marking in central position by turning the actuation axis.
- 5 Activate rope pull switch by pulling.



The direction of the safety rope can be changed using rope pulley blocks or eyebolts. Direction changes of up to max. 90° are possible. Rope pulley blocks have the advantage that the frictional forces between the safety rope and deflection points are kept low.

## Temperature dependence

When planning safety installations with rope pull switches, it is necessary to take into account the temperature dependence of the installation and the safety rope so that the switch is not tripped as a result of a change in temperature. To do this, the possible rope lengths must be determined and the trip point must be readjusted regularly. The following graph shows the relationship between rope length and temperature. Installation should take place at a temperature of 20 °C.



		Rope tension length $L_{max}$ in meters [m]																																																																									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	55	60	65	70	75																																		
Max. temperature fluctuation [K]	± 40 K																																																																										
	± 35 K																																																																										
	± 30 K																																																																										
	± 25 K																																																																										
	± 20 K																																																																										
	± 15 K																																																																										
	± 10 K																																																																										
	± 5 K																																																																										
	± 3.5 K																																																																										
RPS...100	Rope tension length max. 25 m																																																																										
RPS...175	Rope tension length max. 37.5 m																																																																										
RPS...300	Rope tension length max. 75 m																																																																										

## Selection table for rope pull switches RPS

**Housing material**

**K** Plastic

**M** Metal

---

**Version**

**P** Blue reset button

**S** Emergency stop

---

**Rope attachment**

**R** Pull lug

**C** Clamping head

---

**Actuating force**

**100** Actuating force 100 N

**175** Actuating force 175 N

**300** Actuating force 300 N

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**LED**

LED left or right

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**Switching element**

**4 contacts** 3 NC ⊕ + 1 NO or 2 NC ⊕ + 2 NO

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**Connection**

**M** Thread M20 x 1.5 for cable gland

**SFM** Plug connector 5-pin

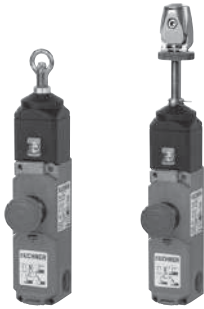
**BHA** Plug connector 10-pin

Housing material		Version		Rope attachment		Actuating force [N]			LED	Switching element, 4 contacts	Connection			Page
Plastic	Metal	P	S	R	C	100	175	300			M	M12	MR10	
●		●		●		●				●	●			14
●		●		●			●			●	●			14
●		●		●				●		●	●			14
●		●			●	●				●	●			15
●		●			●		●			●	●			15
●		●			●			●		●	●			15
●			●		●	●				●	●			15
●			●		●		●			●	●			15
●			●		●	●			●	●			●	16
●			●		●		●		●	●			●	16
●			●		●			●	●	●			●	16
	●		●		●		●			●	●			17
	●		●		●			●		●	●			17
	●		●		●		●			●		●		18
	●		●		●			●		●		●		18
	●		●		●		●		●	●		●		19
	●		●		●			●	●	●			●	20
	●		●		●			●	●	●			●	20



## Rope pull switch with pull-release for emergency stop device

- ▶ Plastic housing
- ▶ Emergency stop device with detent mechanism according to EN ISO 13850 and EN 60204-1
- ▶ Pull lug or clamping head for pull rope
- ▶ Indication of correct rope tension
- ▶ 3 cable entries
- ▶ Switching elements with 4 switching contacts

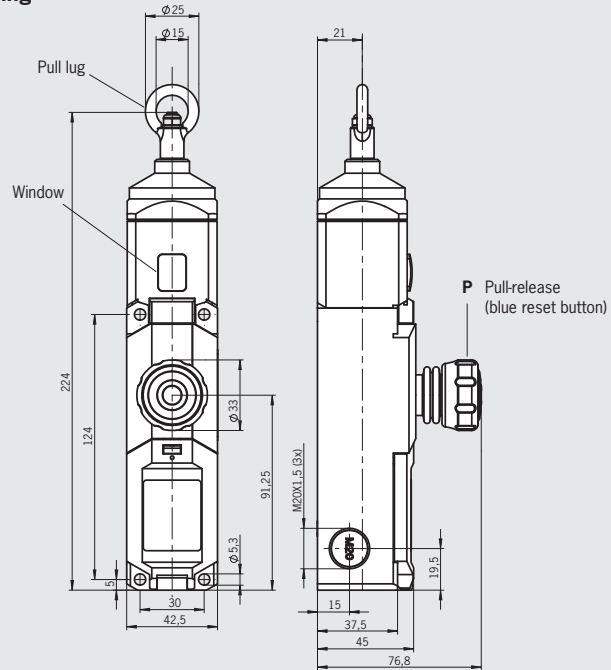


### Switching elements

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

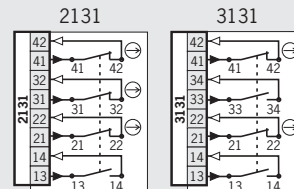
**Cable entry M20 x 1.5**  
Pull-release for emergency stop, pull lug for tensioning rope

### Dimension drawing



Cable glands, see page 24

### Wiring diagrams Switch not actuated



For switching functions, see technical data on page 27

### Ordering table

Series	Connection	Rope attachment	Version	Actuating force [N]	Switching element	Order No./item
RPS	Cable entry 3 x M20 x 1.5	R Pull lug	P Blue reset button	100	2131 3 NC ⊖ + 1 NO	094849 RPS2131PR100M
					3131 2 NC ⊖ + 2 NO	088888 RPS3131PR100M
				175	2131 3 NC ⊖ + 1 NO	094850 RPS2131PR175M
					3131 2 NC ⊖ + 2 NO	088889 RPS3131PR175M
				300	2131 3 NC ⊖ + 1 NO	094851 RPS2131PR300M
					3131 2 NC ⊖ + 2 NO	088890 RPS3131PR300M

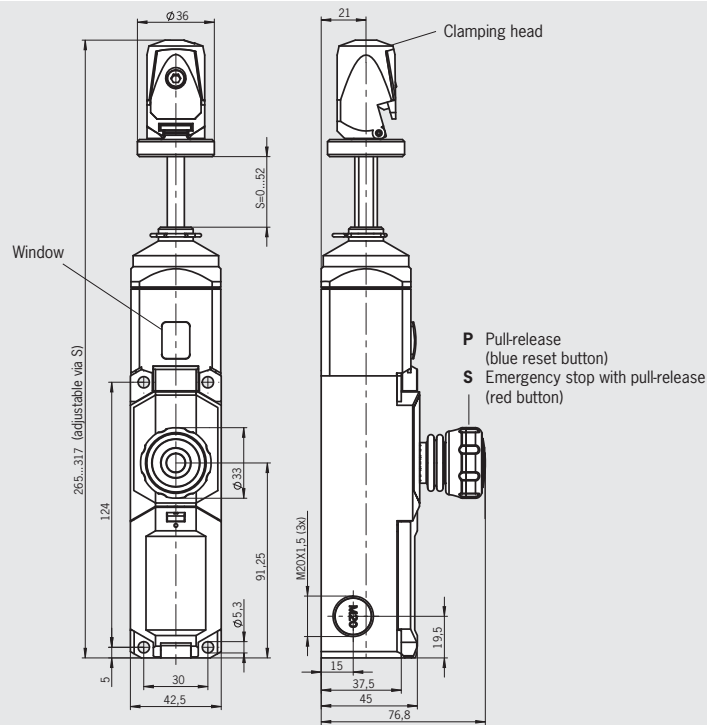


## Rope pull switch with pull-release for emergency stop device

**Cable entry M20 x 1.5**

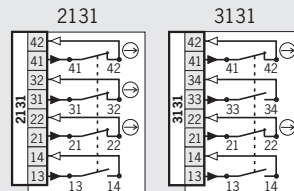
Pull-release for emergency stop, clamping head for tensioning rope

### Dimension drawing



Cable glands, see page 24

### Wiring diagrams Switch not actuated



For switching functions, see technical data on page 27

### Ordering table

Series	Connection	Rope attachment	Version	Actuating force [N]	Switching element	Order No./item
RPS	Cable entry 3 x M20 x 1.5	C Clamping head	P Blue reset button	100	2131 3 NC ⊖ + 1 NO	094852 RPS2131PC100M
					3131 2 NC ⊖ + 2 NO	088885 RPS3131PC100M
				175	2131 3 NC ⊖ + 1 NO	094853 RPS2131PC175M
					3131 2 NC ⊖ + 2 NO	088886 RPS3131PC175M
				300	2131 3 NC ⊖ + 1 NO	094854 RPS2131PC300M
					3131 2 NC ⊖ + 2 NO	088887 RPS3131PC300M
			S Emergency stop	100	2131 3 NC ⊖ + 1 NO	094430 RPS2131SC100M
					3131 2 NC ⊖ + 2 NO	088882 RPS3131SC100M
				175	2131 3 NC ⊖ + 1 NO	094431 RPS2131SC175M
					3131 2 NC ⊖ + 2 NO	088883 RPS3131SC175M
				300	2131 3 NC ⊖ + 1 NO	094432 RPS2131SC300M
					3131 2 NC ⊖ + 2 NO	088884 RPS3131SC300M

## Rope pull switch with pull-release for emergency stop device



- ▶ Plastic housing
- ▶ Emergency stop device with detent mechanism according to EN ISO 13850 and EN 60204-1
- ▶ Clamping head for pull rope
- ▶ Indication of correct rope tension
- ▶ Plug connector MR10
- ▶ LED left or right
- ▶ Switching element with 4 switching contacts



### Switching elements

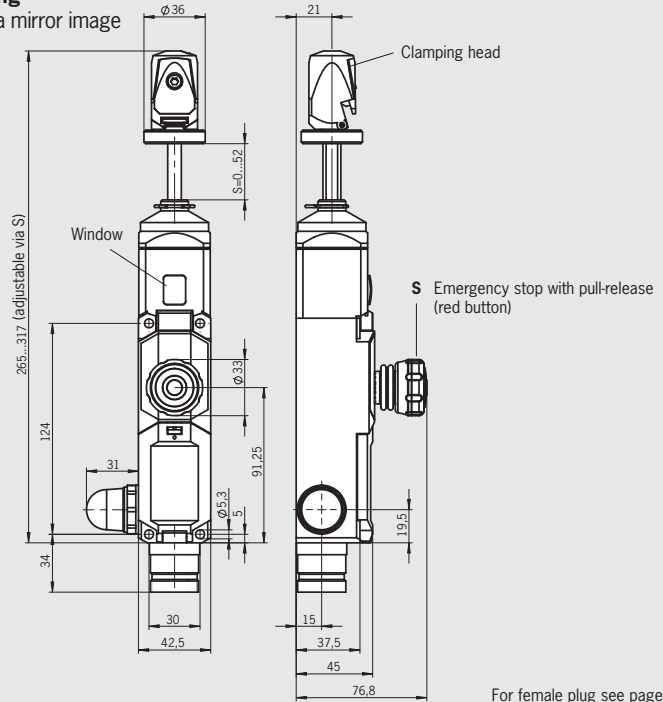
- ▶ **3131** Slow-action switching contact  
2 NC ⊖ + 2 NO

### Plug connector MR10

10-pin, pull-release for emergency stop, clamping head for tensioning rope

### Dimension drawing

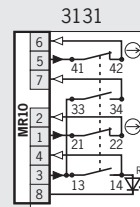
LED on the right is a mirror image



For female plug see page 23

### Wiring diagrams

Switch not actuated



For switching functions, see technical data on page 27

### Ordering table

Series	Connection	Rope attachment	Version	Actuating force [N]	Switching element	LED	Order No./item
RPS	Plug connector MR10	C Clamping head	S Emergency stop	100	3131 2 NC ⊖ + 2 NO	left	<b>094083</b> RPS3131SC100BHA10LL024
						right	<b>094084</b> RPS3131SC100BHA10RL024
				175	3131 2 NC ⊖ + 2 NO	left	<b>094085</b> RPS3131SC175BHA10LL024
						right	<b>094086</b> RPS3131SC175BHA10RL024
				300	3131 2 NC ⊖ + 2 NO	left	<b>094087</b> RPS3131SC300BHA10LL024
						right	<b>094088</b> RPS3131SC300BHA10RL024





## Rope pull switch with pull-release for emergency stop device

- ▶ Metal housing
- ▶ Emergency stop device with detent mechanism according to EN ISO 13850 and EN 60204-1
- ▶ Clamping head for pull rope
- ▶ Indication of correct rope tension
- ▶ 3 cable entries M20 x 1.5
- ▶ Switching elements with 4 switching contacts
- ▶ Pre-failure monitoring for the rope tension optional



### Pre-failure monitoring

An additional monitoring output is used to signal that the permissible rope tension is exceeded and to indicate imminent triggering.

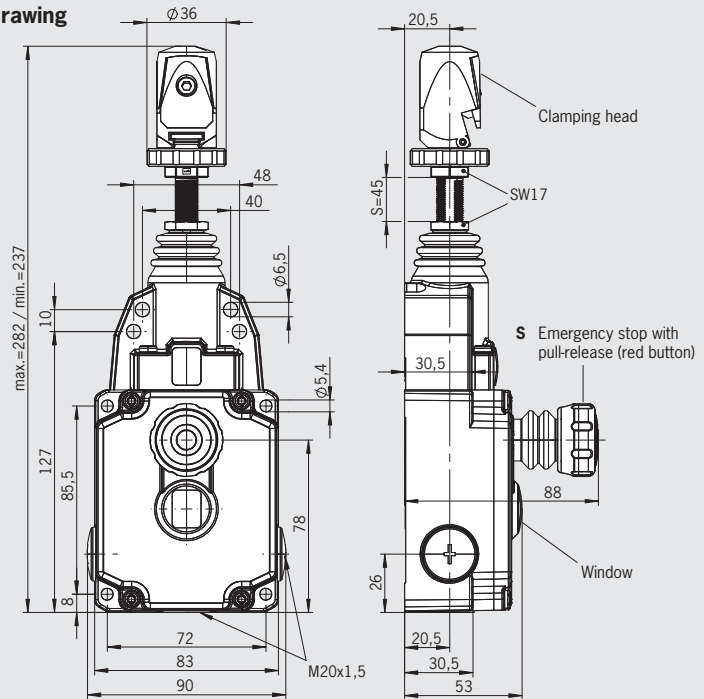
### Switching elements

- ▶ **3131** Slow-action switching contact  
2 NC ⊖ + 2 NO

### Cable entry M20 x 1.5

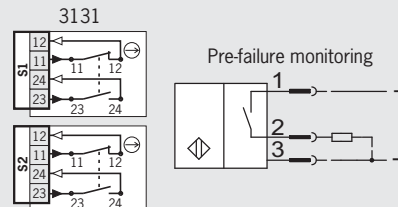
Pull-release for emergency stop, clamping head for tensioning rope

### Dimension drawing



Cable glands, see page 24

### Wiring diagrams Switch not actuated



For switching functions, see technical data on page 27

### Ordering table

Series	Connection	Rope attachment	Version	Actuating force [N]	Switching element	Pre-failure monitoring	Order No./item
RPS-M	Cable entry 3 x M20 x 1.5	C Clamping head	S Emergency stop	175	3131 2 NC ⊖ + 2 NO	with	<b>114981</b> RPS-M-E-3131SC175M
						without	<b>114983</b> RPS-M-3131SC175M
				300	3131 2 NC ⊖ + 2 NO	with	<b>114982</b> RPS-M-E-3131SC300M
						without	<b>114984</b> RPS-M-3131SC300M



## Rope pull switch with pull-release for emergency stop device

- ▶ Metal housing
- ▶ Emergency stop device with detent mechanism according to EN ISO 13850 and EN 60204-1
- ▶ Clamping head for pull rope
- ▶ Indication of correct rope tension
- ▶ Plug connector M12
- ▶ 2 cable entries M20 x 1.5
- ▶ Switching elements with 4 switching contacts



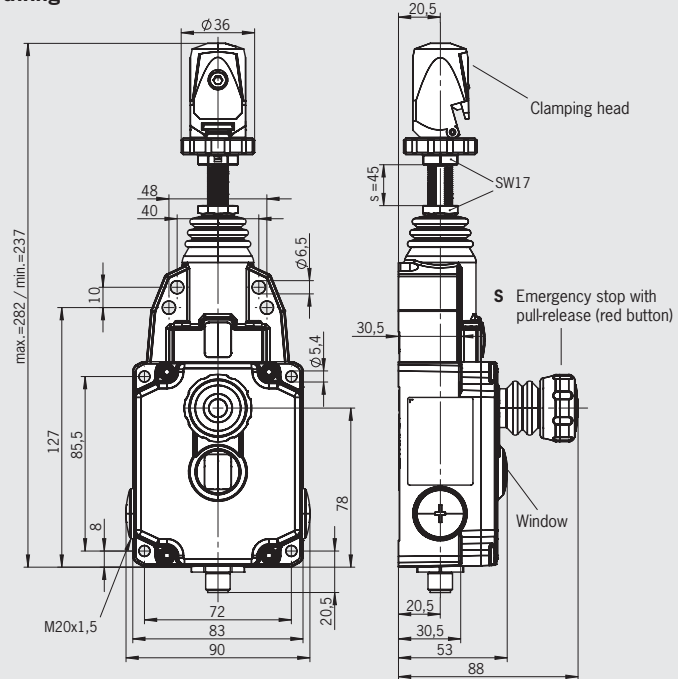
### Switching elements

- ▶ **3131** Slow-action switching contact  
2 NC ⊖ + 2 NO

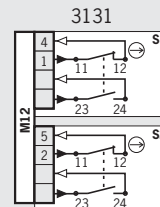
### Plug connector M12

5-pin, pull-release for emergency stop, clamping head for tensioning rope

### Dimension drawing



### Wiring diagrams Switch not actuated



For switching functions, see technical data on page 27

### Ordering table

Series	Connection	Rope attachment	Version	Actuating force [N]	Switching element	Order No./item
RPS-M	Plug connector M12	C Clamping head	S Emergency stop	175	<b>3131</b> 2 NC ⊖ + 2 NO	<b>119842</b> RPS-M-3131SC175SFM5
				300	<b>3131</b> 2 NC ⊖ + 2 NO	<b>119844</b> RPS-M-3131SC300SFM5



## Rope pull switch with pull-release for emergency stop device

- ▶ Metal housing
- ▶ Emergency stop device with detent mechanism according to EN ISO 13850 and EN 60204-1
- ▶ Clamping head for pull rope
- ▶ Indication of correct rope tension
- ▶ Plug connector M12
- ▶ 1 cable entry M20 x 1.5
- ▶ LED left or right
- ▶ Switching elements with 4 switching contacts



### Switching elements

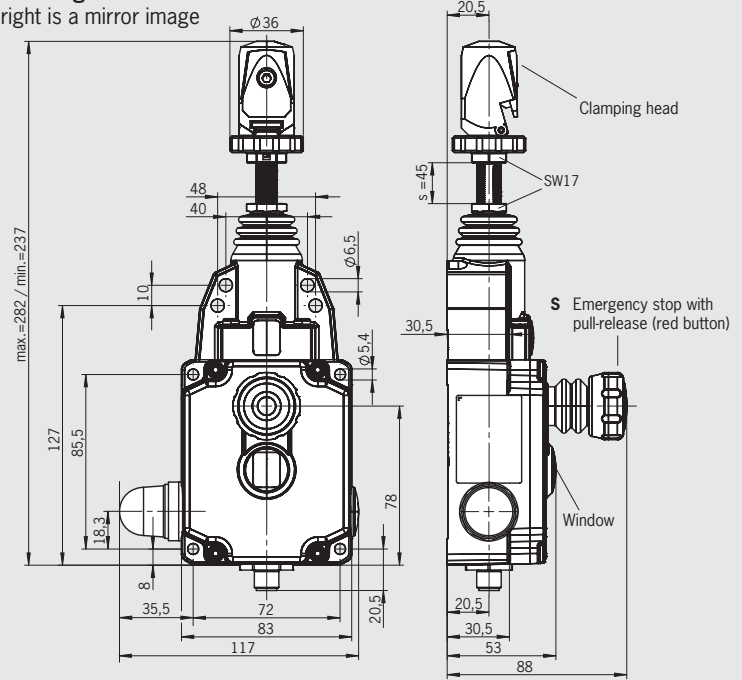
- ▶ **3131** Slow-action switching contact  
2 NC ⊖ + 2 NO

### Plug connector M12

5-pin, pull-release for emergency stop, clamping head for tensioning rope

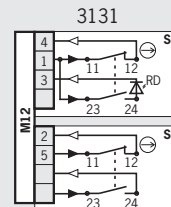
### Dimension drawing

LED on the right is a mirror image



For female plug see page 24

### Wiring diagrams Switch not actuated



For switching functions, see technical data on page 27

### Ordering table

Series	Connection	Rope attachment	Version	Actuating force [N]	Switching element	LED	Order No./item
RPS-M	Plug connector M12	C Clamping head	S Emergency stop	175	3131 2 NC ⊖ + 2 NO	left	<b>122860</b> RPS-M-3131SC175SFM5LL024C2424
						right	<b>122861</b> RPS-M-3131SC175SFM5RL024C2424



## Rope pull switch with pull-release for emergency stop device

- ▶ Metal housing
- ▶ Emergency stop device with detent mechanism according to EN ISO 13850 and EN 60204-1
- ▶ Clamping head for pull rope
- ▶ Indication of correct rope tension
- ▶ Plug connector MR10
- ▶ 1 cable entry M20 x 1.5
- ▶ LED left or right
- ▶ Switching elements with 4 switching contacts



### Switching elements

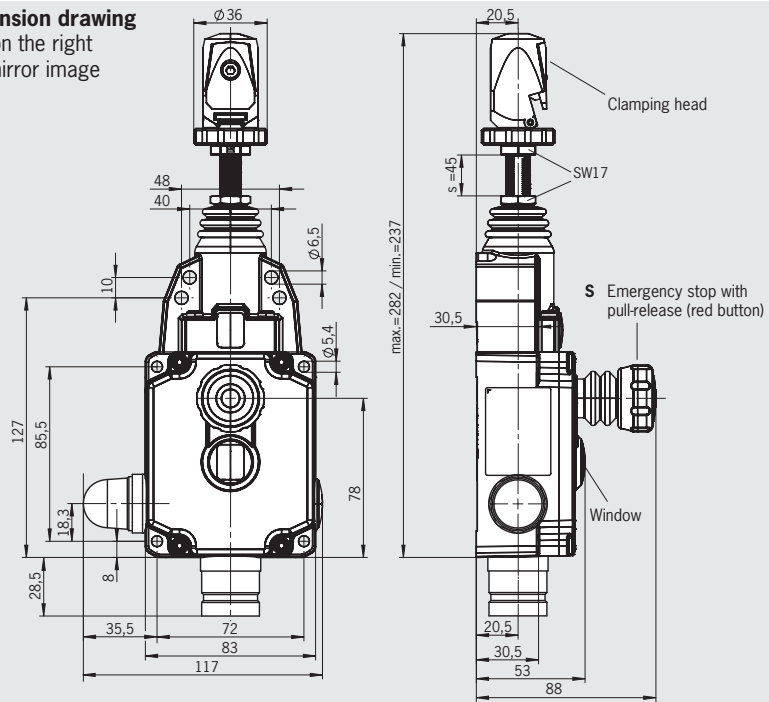
- ▶ **3131** Slow-action switching contact  
2 NC ⊖ + 2 NO

### Plug connector MR10

10-pin, pull-release for emergency stop, clamping head for tensioning rope

### Dimension drawing

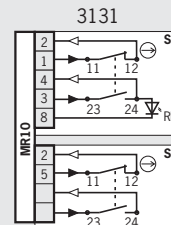
LED on the right is a mirror image



For female plug see page 23

### Wiring diagrams

Switch not actuated



For switching functions, see technical data on page 27

### Ordering table

Series	Connection	Rope attachment	Version	Actuating force [N]	Switching element	LED	Order No./item
RPS-M	Plug connector MR10	C Clamping head	S Emergency stop	175	3131 2 NC ⊖ + 2 NO	left	<b>119838</b> RPS-M-3131SC175BHA10LL024
						right	<b>119841</b> RPS-M-3131SC175BHA10RL024
			S Emergency stop	300	3131 2 NC ⊖ + 2 NO	left	<b>119839</b> RPS-M-3131SC300BHA10LL024
						right	<b>119840</b> RPS-M-3131SC300BHA10RL024

## Accessories for rope pull switches

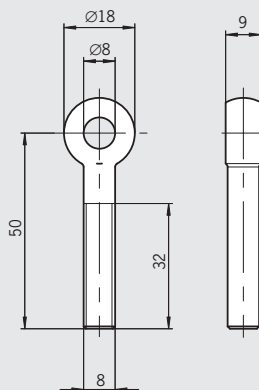
- ▶ Eyebolt
- ▶ Rope set
- ▶ Pulley set
- ▶ Rope pulley block
- ▶ Turnbuckle
- ▶ Tensioner spring
- ▶ Tensioning rope
- ▶ Built-in LED

### Built-in LED

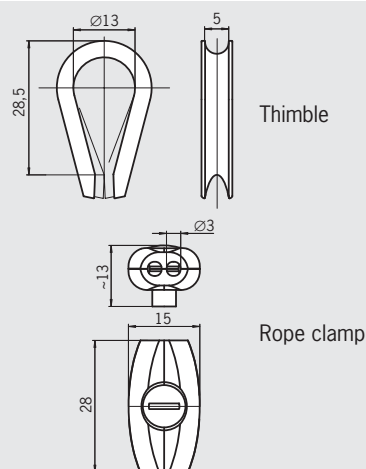
The built-in LED is suitable for direct installation in one of the M20 x 1.5 threads of the three cable entries in the rope pull switch RPS. The built-in LED indicates to the operator whether the switch is actuated or not. The switching element can be wired individually. Operating voltage DC 24 V +10%, -15%.

### Eyebolt Thread M8

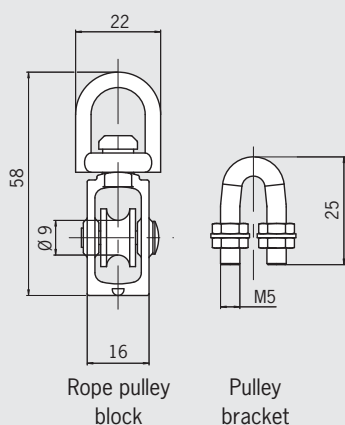
#### Dimension drawings



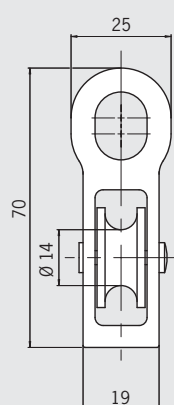
### Rope set



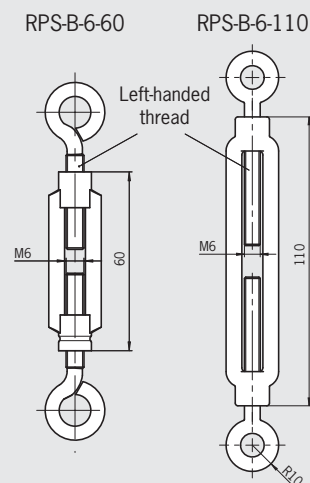
### Pulley set RPS-PS/V5



### Rope pulley block RPS-P



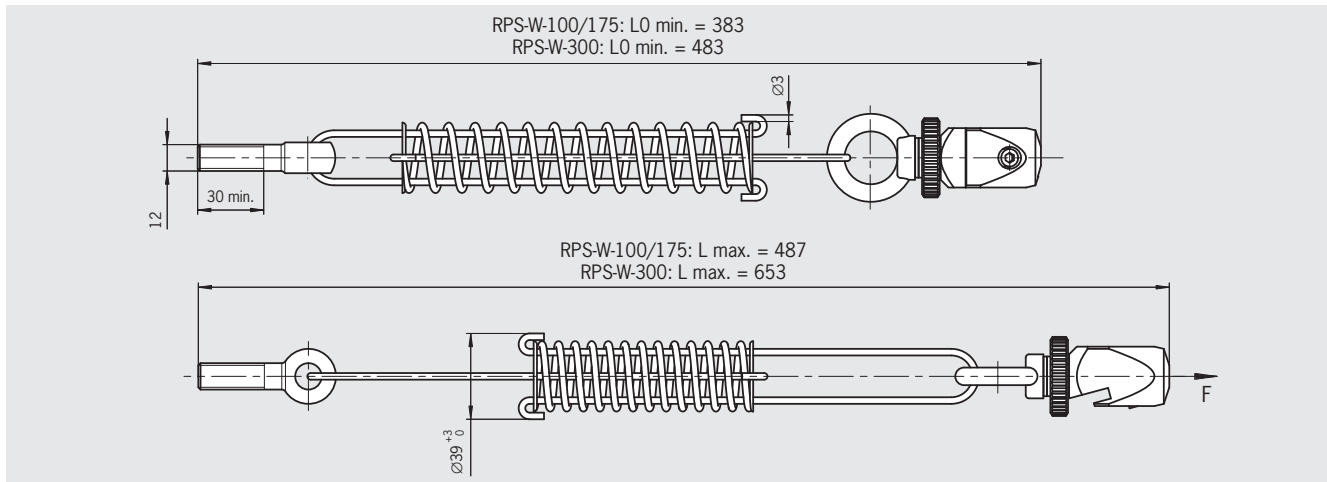
### Turnbuckle



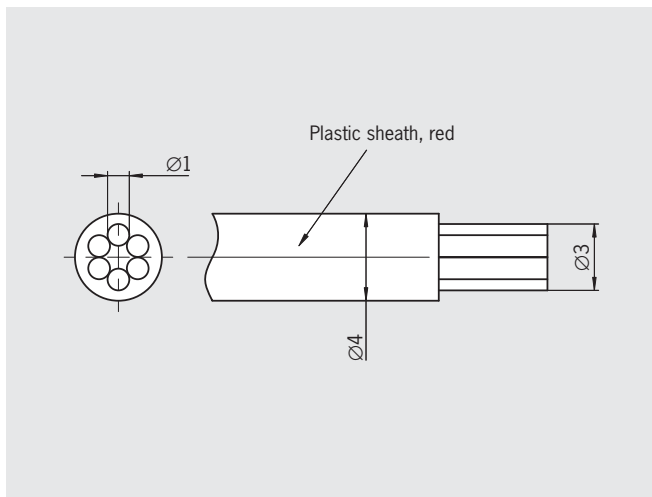
### Ordering table

Designation	Version	Packaging unit	Order No./item
Eyebolt	Thread M8	5 pcs.	<b>092495</b> RPS-O-8-50/V5
Rope set	Consisting of thimble and rope clamp	5 pcs.	<b>092496</b> RPS-RS/V5
Pulley set RPS-PS/V5	Consisting of rope pulley block Ø 9 mm and pulley bracket	5 pcs.	<b>092501</b> RPS-PS/V5
Rope pulley block RPS-P	Rope pulley block Ø 14 mm	1 pcs.	<b>096251</b> RPS-P
Turnbuckle	M6 x 60	5 pcs.	<b>092498</b> RPS-B-6-60/V5
	M6 x 110	1 pcs.	<b>092500</b> RPS-B-6-110

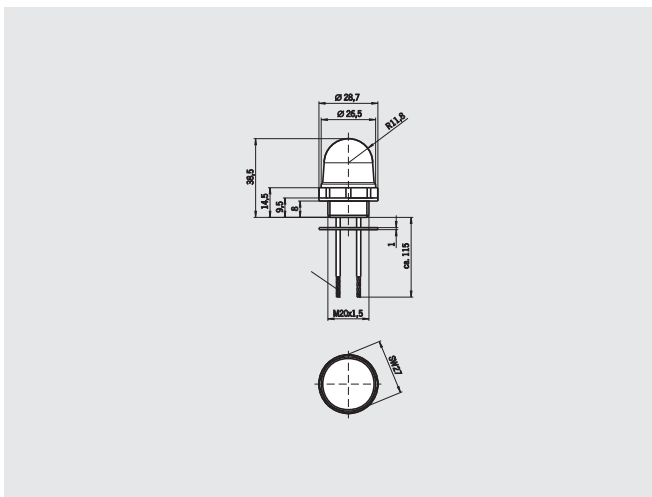
## Tensioner spring



## Tensioning rope



## Built-in LED



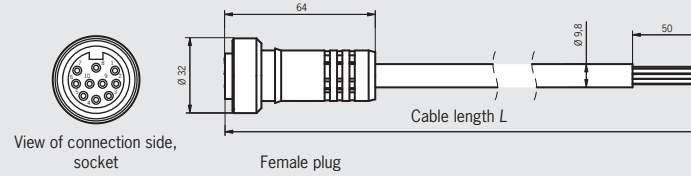
## Ordering table

Designation	Version	Packaging unit	Order No./item
Tensioner spring	For tensile force 110 N / 175 N	1 pcs.	<b>092136</b> RPS-W-100/175
	For tensile force 300 N	1 pcs.	<b>092138</b> RPS-W-300
Tensioning rope	Length 50 m	1 pcs.	<b>092813</b> RPS+3-4/50m
	Length 100 m	1 pcs.	<b>092814</b> RPS+3-4/100m
Built-in LED	Color red for cable entry M20 x 1.5, with seal Light radiation to side	1 pcs.	<b>087423</b> LED M20x1.5
	Color red for cable entry M20 x 1.5, with seal light radiation to front	1 pcs.	<b>095510</b> LED-F M20x1.5

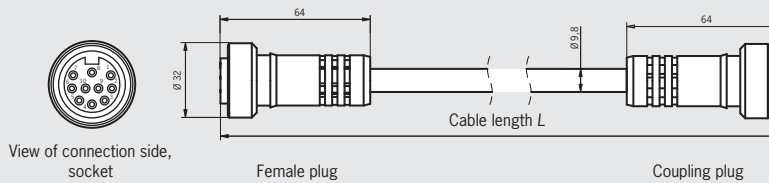
## Female plugs/extension cables for rope pull switch RPS...MR10

### Female plug with cable 10-pin

#### Dimension drawings



### Extension cable 10-pin



#### Assignment of female plug MR10 with cable

Pin	Wire color	Conductor cross-section [mm <sup>2</sup> ]
1	OG	0.82 (18 AWG)
2	BU	0.82 (18 AWG)
3	WH/BK	0.82 (18 AWG)
4	RD/BK	0.82 (18 AWG)
5	GN/BK	0.82 (18 AWG)

Pin	Wire color	Conductor cross-section [mm <sup>2</sup> ]
6	OG/BK	0.82 (18 AWG)
7	RD	0.82 (18 AWG)
8	GN/YE	0.82 (18 AWG)
9	BK	0.82 (18 AWG)
10	WH	0.82 (18 AWG)

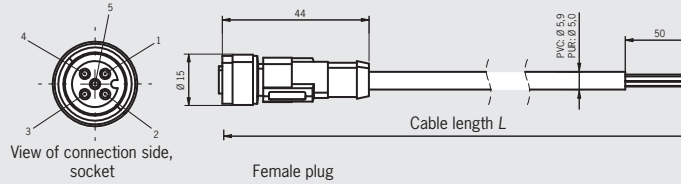
#### Ordering table

Version	Material	Cable length L [mm]						
		1,800	3,600	6,000	9,100	12,100	15,200	18,200
Female plug with cable 10-pin	PVC	100949	100950	100951	100952	102505	100953	-
	PUR	102516	102517	102518	100956	102519	102520	102521
Extension cable 10-pin	PVC	-	100954	-	100955	-	-	-
	PUR	-	-	100957	-	-	100958	-

## Female plug for rope pull switch RPS...SFM5 (M12)

Female plug with cable  
5-pin

### Dimension drawings



### Assignment of female plug SFM5 with cable

Pin	Wire color	Conductor cross-section [mm <sup>2</sup> ]
1	BN	0.34 (22 AWG)
2	WH	0.34 (22 AWG)
3	BU	0.34 (22 AWG)
4	BK	0.34 (22 AWG)
5	GY	0.34 (22 AWG)

### Ordering table

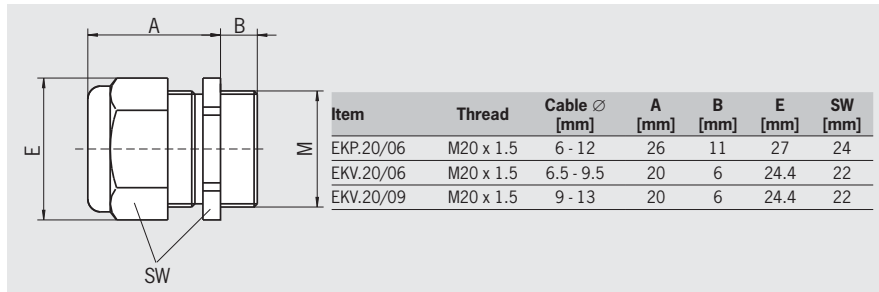
Version	Material	Cable length L [mm]			
		5,000	10,000	20,000	30,000
Female plug with cable 5-pin	PVC	100183	100184	100185	-
	PUR	113620	113640	113682	122784

## Cable glands

### ► M20 x 1.5

#### Cable glands

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



### Ordering table

Thread	Version	Material	
		Metal	Plastic
M20 x 1.5	Cable diameter 6 - 12 mm	-	086233 EKPM20/06
	Cable diameter 6.5 - 9.5 mm	077683 EKVM20/06	-
	Cable diameter 9 - 13 mm	077684 EKVM20/09	-



## Technical data of rope pull switch RPS



The technical data on switches and switching elements apply to all connections. Further technical data are given for the connection selected.

### Reliability values according to EN ISO 13849-1

Parameter		Value	Unit
B10d	RPS	1 x 10 <sup>5</sup> operating cycles	
	RPS-M	2 x 10 <sup>5</sup> operating cycles	

### Switch, plastic housing

Parameter		Value	Unit		
Housing material		Reinforced thermoplastic			
Actuator material		Die-cast zinc, steel			
Mechanical life		Acc. to EN 60947-5-5			
Ambient temperature		- 25 ... + 70	°C		
Weight		Approx. 0.8	kg		
Latching device		Acc. to EN ISO 13850			
		<b>RPS...100</b>	<b>RPS...175</b>	<b>RPS...300</b>	
Actuating force		100	175	300	N
Rope length max.		25	37.5	75	m
Rope diameter		2 ... 5			mm
Rope attachment	RPS...R...	Via pull lug			
	RPS...C...	Via clamping head			
Version	RPS...P...	Blue reset button			
	RPS...S...	Emergency stop			

### Switch, metal housing

Parameter		Value	Unit		
Housing material		Die-cast aluminum			
Actuator material		Die-cast zinc, steel			
Mechanical life		Acc. to EN 60947-5-5			
Ambient temperature		- 30 ... + 80	°C		
Weight		Approx. 1.00	kg		
Latching device		Acc. to EN ISO 13850			
		<b>RPS...175</b>	<b>RPS...300</b>		
Actuating force		175	300	N	
Rope length max.		37.5	75	m	
Rope diameter		2 ... 5			mm
Rope attachment	RPS...C...	Via clamping head			
Version	RPS...S...	Emergency stop			


### Switching element




Parameter		Value	Unit
Switching principle		Slow-action switching contact	
Switching element with 4 switching contacts		<b>2131</b> 3 NC $\ominus$ + 1 NO	<b>3131</b> 2 NC $\ominus$ + 2 NO
Contact opening gap		> 2 x 2 mm	
Min. switching current at 24 V DC		10	mA


### Pre-failure monitoring

Parameter		Value	Unit
Rated insulation voltage U <sub>i</sub>		250	V AC/DC
Conventional thermal current I <sub>th</sub>		10	A
Rated operating voltage U <sub>e</sub>		240	V
Utilization category acc. to IEC 60947-5-1	AC-15	I <sub>e</sub> 3 A U <sub>e</sub> 240 V / I <sub>e</sub> 6 A U <sub>e</sub> 120 V	
	DC-13	I <sub>e</sub> 0.27 A U <sub>e</sub> 250 V	
	DC-15	I <sub>e</sub> 0.55 A U <sub>e</sub> 125 V	
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)		6	A DI/gG
Safety class		I	

Connection, cable entry M20 x 1.5			
Parameter		Value	Unit
Connection		Screw terminal	
Version		M20 x 1.5	
Conductor cross-section		0.5 ... 1.5	mm <sup>2</sup>
Degree of protection acc. to IEC 60529		IP 67	
Rated insulation voltage U <sub>i</sub>		250	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>		2.5	kV
Conventional thermal current I <sub>th</sub>		10	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)		6	A gG
Utilization category acc. to IEC 60947-5-1	AC-15	I <sub>e</sub> 3 A U <sub>e</sub> 240 V	

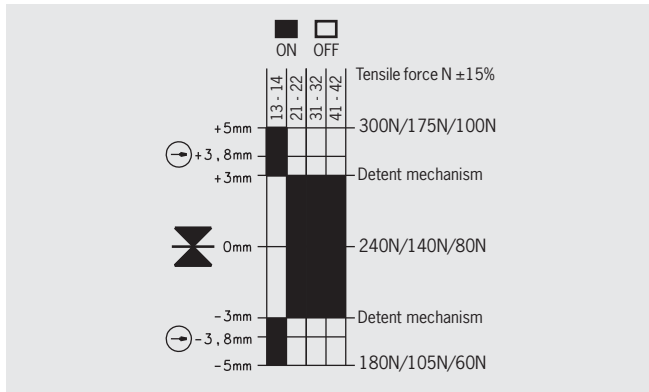
Connection, plug connector MR10			
Parameter		Value	Unit
Connection		Plug connector	
Version		MR10 (10-pin)	
Degree of protection acc. to IEC 60529		IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>		50	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>		2.5	kV
Conventional thermal current I <sub>th</sub>		4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)		4	A gG
Utilization category acc. to IEC 60947-5-1	AC-15	I <sub>e</sub> 3 A U <sub>e</sub> 50 V	
	DC-13	I <sub>e</sub> 3 A U <sub>e</sub> 24 V	

1) Screwed tight with the related plug connector (see page 20)

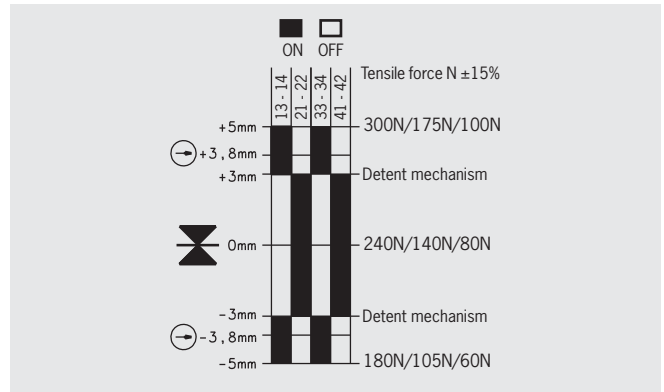
Connection, plug connector M12			
Parameter		Value	Unit
Connection		Plug connector	
Version		M12 (5-pin, without PE)	
Degree of protection acc. to IEC 60529	- for housing without LED	IP 67 <sup>1)</sup>	
	- for housing with LED	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>		50	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>		2.5	kV
Conventional thermal current I <sub>th</sub>		4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)		4	A gG
Utilization category acc. to IEC 60947-5-1	AC-15	I <sub>e</sub> 3 A U <sub>e</sub> 50 V	
	DC-13	I <sub>e</sub> 0.27 A U <sub>e</sub> 50 V	

1) Screwed tight with the related plug connector (see page 20)

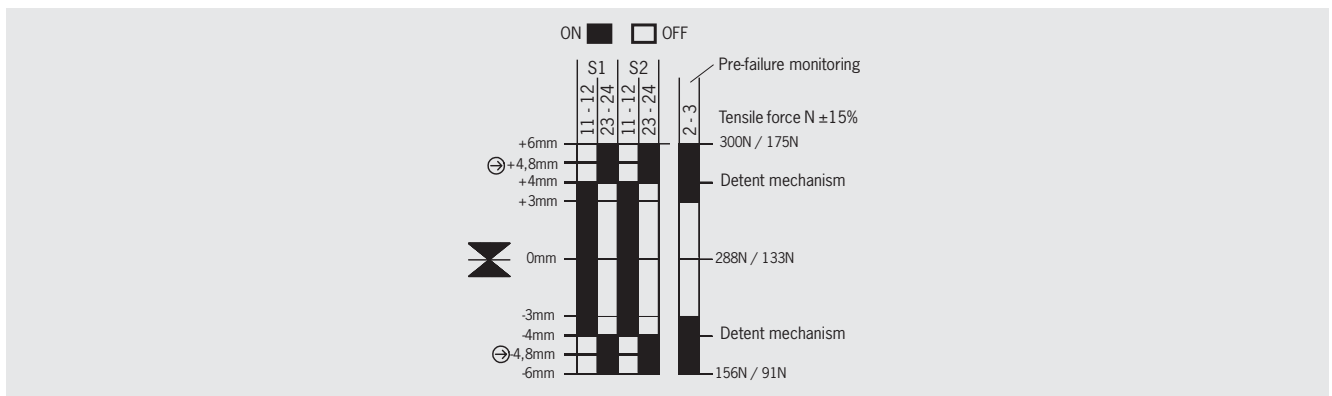
## Travel diagram RPS2131...



## Travel diagram RPS3131...



## Travel diagram RPS-M-3131... with metal housing Travel diagram RPS-M-E-3131... with metal housing and pre-failure monitoring



## Technical data, rope pull switch RPS accessories

### Tensioner spring

Parameter	Value	Unit
Material of rope clamp	Die-cast zinc/steel	
Material of spring	X12CrNi177 (1.4310)	
Eyebolt	DIN 444 M12x50-4.6 Zn	
Ambient temperature	-25 ... +70	°C
Rope diameter	2 ... 5	mm
Rope attachment	Quick-action clamping device	
	<b>RPS-W-100/175</b>	<b>RPS-W-300</b>
Spring rate	2.1	N/mm
Maximum spring force	218	N
Weight	Approx. 0.5	kg

### Built-in LED

Parameter	Value	Unit
Material of housing	ABS/PC blend, black	
Material of cap	Transparent polycarbonate	
Degree of protection (fitted in rope pull switch)	IP 65	
Ambient temperature	-20 ... +50	°C
Connection	2 strands	
Mounting	M20 x 1.5	
Operating voltage	24	V DC
Switch-on current	< 0.5	A
Current consumption	45	mA

## Index by item designation

Item	Order no.	Page	Item	Order no.	Page
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EKVM20/06	077683	24	RPS3131SC175M	088883	15
EKVM20/09	077684	24	RPS3131SC300BHA10LL024	094087	16
ES-FB1W-XW1E-BV412MFR-YO	105017	7	RPS3131SC300BHA10RL024	094088	16
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ES-MW9Z-T1	106337	8			
ES-XA1E-BV3U02R	106435	7			
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ES-XN4E-BL413MFRH	124713	7			
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RPS-I-3-4/50m	092813	22			
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RPS-M-3131SC175BHA10RL024	119841	20			
RPS-M-3131SC175M	114983	17			
RPS-M-3131SC175SFM5	119842	18			
RPS-M-3131SC175SFM5LL024C2424	122860	19			
RPS-M-3131SC175SFM5RL024C2424	122861	19			
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RPS-M-3131SC300BHA10RL024	119840	20			
RPS-M-3131SC300M	114984	17			
RPS-M-3131SC300SFM5	119844	18			
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