



**Application**

Ex pull-wire emergency stop switches are mounted on machines and sections of plants which cannot be protected by guards. In contrast to mushroom head emergency stop push buttons, on pull-wire switches the emergency stop command can be initiated from any point along the wire. In combination with one safety monitoring module for emergency stop applications, ZS range Ex pull-wire emergency stop switches can be used for Control Category 3 or 4 to EN 954-1.

The Ex pull-wire emergency stop switches have a positive linkage between the NC contacts and the pulling eye.

**Design and mode of operation**

The Ex pull-wire emergency stop switches are brought into their operating condition by pre-tensioning the wire, i.e. the NC contacts are closed and the NO contacts open. All Ex pull-wire emergency stop switches have wire-breakage monitoring. On pulling or breakage of the wire, the NC contacts are positively opened and the NO contacts are closed. The switch can then only be returned to the operational condition by a resetting operation. The wire is to be pre-tensioned until the operational condition is reached. Only in this condition is the wire-breakage monitoring activated, the NC contacts closed and the NO contacts open.

A wide range of accessories is available for all pull-wire emergency stop switches, see chapter 1.5.6.

The pull-wire emergency stop switches are of protection class IP 65 or IP 54. Any desired mounting position can be used.

**1.**  
**1.5**

**Ex switchgear**  
**Safety switches**  
**Pull-wire emergency stop switches**



**Features**  
**EEx ZS 71**

- 2 contacts
- 2 spring-force variants
- Optional position indication
- Up to 20 m long wire rope

**EEx ZS 75**

- 4 contacts
- 3 spring-force variants
- Adjustable actuating force
- Up to 50 m long wire rope

**EEx ZS 75 S**

- 4 contacts
- Two-side actuation
- Up to 2 x 50 m long wire rope

**EEx ZS 73**

- 2 contacts
- 4 spring-force variants
- Adjustable actuating force
- Up to 50 m long wire rope

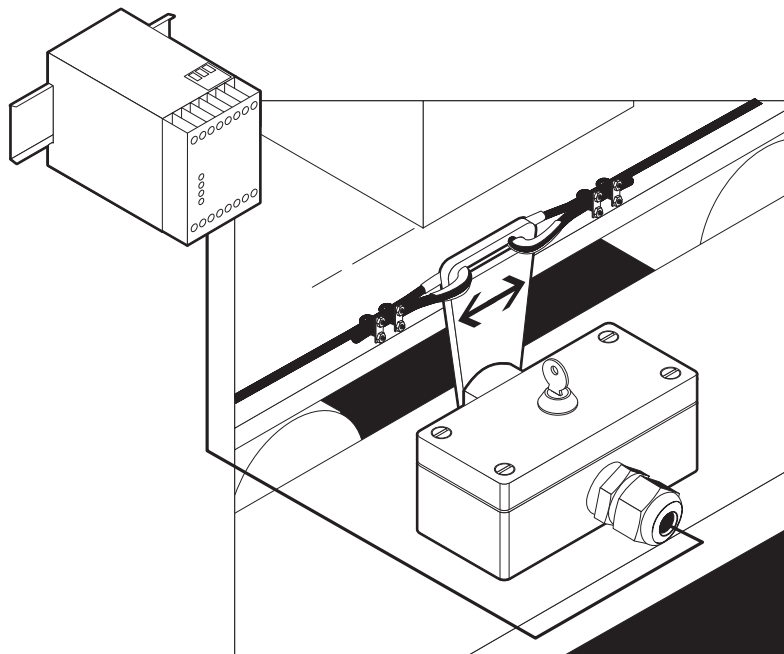
**EEx ZS 73 S**

- 2 contacts
- Two-side actuation
- Up to 2 x 50 m long wire rope

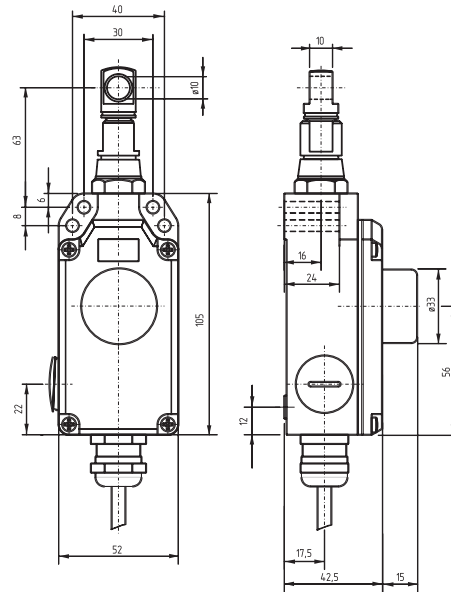
**Note**

Technical data are shown in tabular form in chapter 1.5.7.

**Application**



**1.** Ex switchgear  
**1.5** Safety switches  
**1.5.1** Pull-wire emergency stop switches  
**1.5.1** EEx ZS 71 range



**Features**

- Metal enclosure
- 2 contacts
- II 2G EEx d IIC T6  
II 2D IP65 T80°C
- Small body
- Various spring force variants (pretensioning forces)
- Wire up to 20 m long
- Reset by push button or key possible
- Twisting not possible
- Optional position indicator
- Available with external watertight collar
- Pull-wire and wire-breakage functions

**Cable length**

- On the Ex pull-wire emergency stop switches, the cables are 3 m long
- Other lengths on enquiry

**Note**

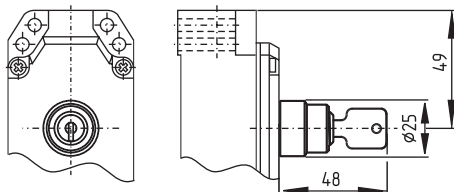
For tensioned span lengths over 3 m, intermediate wire supports are required, see accessories in chapter 1.5.6.

**Approvals**

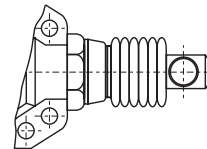
EC Type test certificate: PTB 03 ATEX 1070 X\*

\*referring to the switch insert

**Key reset**



**Watertight collar**



**Info**

Version for equipment category 3D (dust-Ex zone 22) available  
 Ordering suffix: -3D

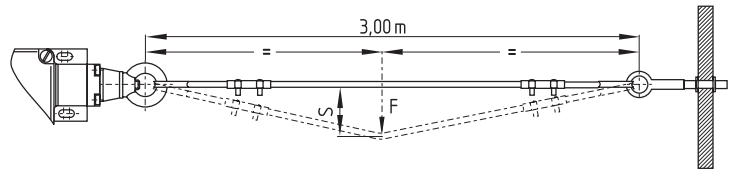
**3D version is equipped with wiring compartment.**

**1. Ex switchgear**  
**1.5 Safety switches**  
**1.5.1 Pull-wire emergency stop switches**  
**1.5.1 EEx ZS 71 range**



**Actuating deflection/force**

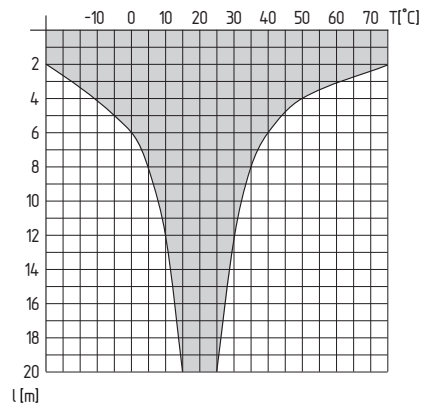
The values quoted relate to the switch being mounted at an ambient temperature of 20 °C. Stretching of the wire due to elongation and deformation of the wire thimbles has not been taken into account. The actuating forces given are only guide values, since the spring forces are subject to tolerances. Actuating deflections and forces relate to a 3 m long wire.



Pre-tensioning force [N]	Actuating deflection S [cm]	Actuating force F [N]	Recommended wire length [m]	Ordering suffix
55	9	11	0-5	-55N
200	9	25	5-20	-200N

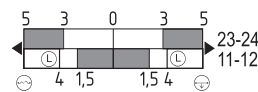
**Temperature range**

Recommended lengths of wire for pull-wire emergency stop switches in relation to the range of ambient temperature.



**Contacts/ Switch travel**

**1 NO**  
**1 NC**  
 BK 23 — 24 BK  
 BN 11 — 12 BU



Push button reset  
 Key reset

Push button reset, watertight collar  
 Key reset, watertight collar

Push button reset, position indicator  
 Key reset, position indicator

Push button reset, watertight collar, position indicator  
 Key reset, watertight collar, position indicator

**EEx ZS 71 1Ö/1S VD**  
**EEx ZS 71 1Ö/1S VS**

**EEx ZS 71 1Ö/1S WVD**  
**EEx ZS 71 1Ö/1S WVS**

**EEx ZS 71 1Ö/1S VDA**  
**EEx ZS 71 1Ö/1S VSA**

**EEx ZS 71 1Ö/1S WVDA**  
**EEx ZS 71 1Ö/1S WVSA**

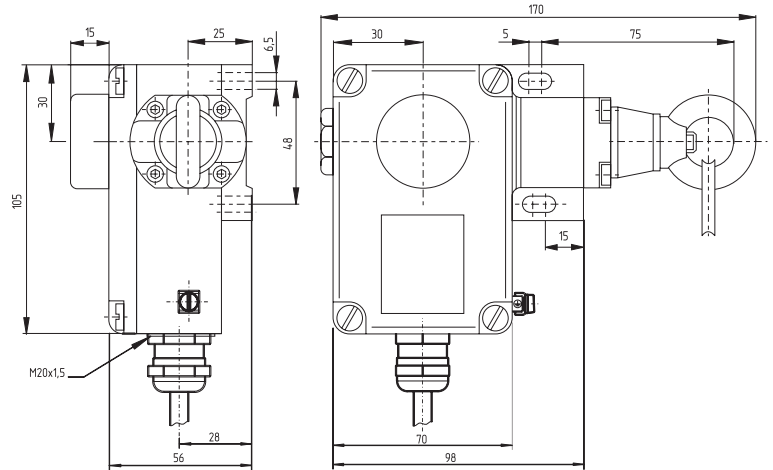
**Note**

Ordering suffix for pretensioning force must always be added to part number, see ordering details.

**Ordering details**

EEx ZS 71 range pull-wire emergency stop switch for one-side operation with one NO and one NC contact, push button reset and 55 N pretensioning force:  
 EEx ZS 71 1Ö/1S VD-55N

**1.** Ex switchgear  
**1.5** Safety switches  
**1.5.2** Pull-wire emergency stop switches  
**1.5.2** EEx ZS 73 range



**Features**

- Metal enclosure
- 2 contacts
- II 2G EEx d IIC T6  
II 2D IP65 T80°C
- 4 spring force variants (pretensioning forces)
- Adjustable actuating force
- Wire up to 50 m long
- Reset by push button or key possible
- Available with external watertight collar
- Pull-wire and wire-breakage functions

**Cable length**

- On the Ex pull-wire emergency stop switches, the cables are 3 m long
- Other lengths on enquiry

**Note**

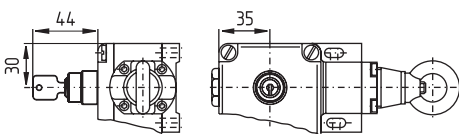
For tensioned span lengths over 5 m, intermediate wire supports are required, see accessories in chapter 1.5.6.

**Approvals**

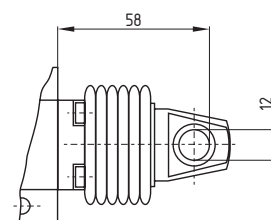
EC Type test certificate:  
PTB 03 ATEX 1070 X\*

\*referring to the switch insert

**Key reset**



**Watertight collar**



**Info**

Version for equipment category 3D (dust-Ex zone 22) available  
 Ordering suffix: -3D

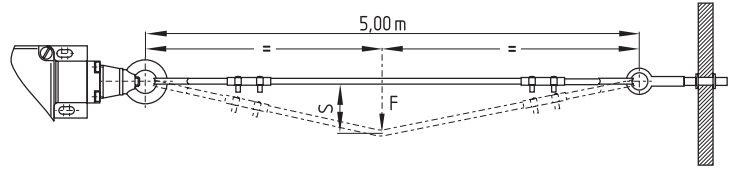
**3D version is equipped with wiring compartment.**

**1. Ex switchgear**  
**1.5 Safety switches**  
**1.5.2 Pull-wire emergency stop switches**  
**1.5.2 EEx ZS 73 range**



**Actuating deflection/force**

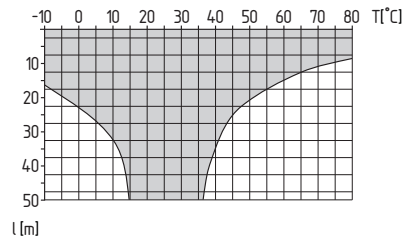
The values quoted relate to the switch being mounted at an ambient temperature of 20 °C. Stretching of the wire due to elongation and deformation of the wire thimbles has not been taken into account. The actuating forces given are only guide values, since the spring forces are subject to tolerances. Actuating deflections and forces relate to a 5 m long wire.



Pre-tensioning force [N]	Actuating deflection S [cm]	Actuating force F [N]	Recommended cable length [m]	Ordering suffix
295-390	12	60	30-50	-295N
195-275	12	41	20-30	-195N
120-180	12	25	10-20	-120N
80-100	12	8	<10	-80N

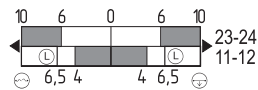
**Temperature range**

Recommended lengths of wire for pull-wire emergency stop switches in relation to the range of ambient temperature.



**Contacts/ Switch travel**

**1 NO**  
**1 NC**  
 BK 23 → 24 BK  
 BN 11 → 12 BU



Push button reset  
 Key reset

**EEx ZS 73 1Ö/1S VD**  
**EEx ZS 73 1Ö/1S VS**

Push button reset, watertight collar  
 Key reset, watertight collar

**EEx ZS 73 1Ö/1S WVD**  
**EEx ZS 73 1Ö/1S WVS**

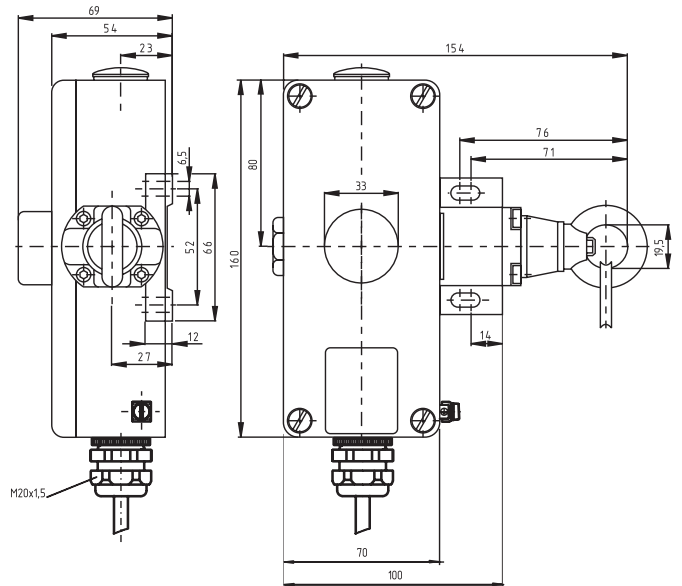
**Note**

Ordering suffix for pretensioning force must always be added to part number, see ordering details.

**Ordering details**

EEx ZS 73 range pull-wire emergency stop switch for one-side operation with one NO and one NC contact, key reset, watertight collar and 295-390 N pretensioning force:  
 EEx ZS 73 1Ö/1S WVS-295N

**1.** Ex switchgear  
**1.5** Safety switches  
**1.5.3** Pull-wire emergency stop switches  
**1.5.3** EEx ZS 75 range



**Features**

- Metal enclosure
- 2 or 4 contacts
- II 2G EEx d IIC T6  
II 2D IP65 T80°C
- 4 spring force variants (pretensioning forces)
- Adjustable actuating force
- Twisting not possible
- Wire up to 50 m long
- Reset by push button or key possible
- Available with external watertight collar
- Pull-wire and wire-breakage functions

**Cable length**

- On the Ex pull-wire emergency stop switches, the cables are 3 m long
- Other lengths on enquiry

**Note**

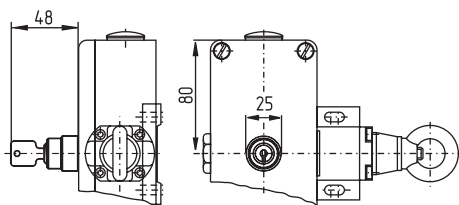
For tensioned span lengths over 5 m, intermediate wire supports are required, see accessories in chapter 1.5.6.

**Approvals**

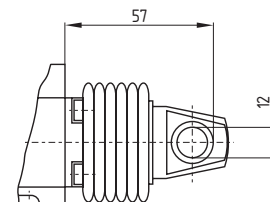
EC Type test certificate:  
PTB 03 ATEX 1070 X\*

\*referring to the switch insert

**Key reset**



**Watertight collar**



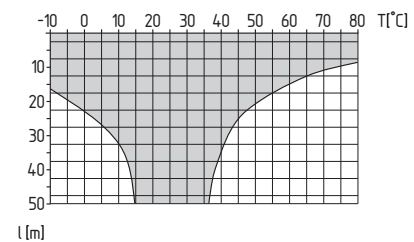
**Temperature range**

Recommended lengths of wire for pull-wire emergency stop switches in relation to the range of ambient temperature.

**Info**

Version for equipment category 3D (dust-Ex zone 22) available  
Ordering suffix: -3D

**3D version is equipped with wiring compartment.**

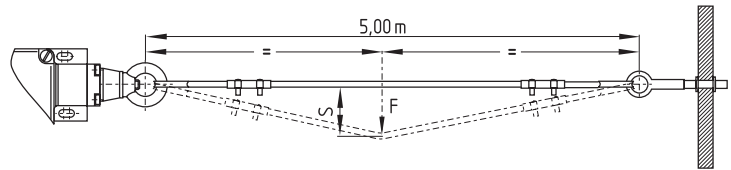


**1. Ex switchgear**  
**1.5 Safety switches**  
**1.5.3 Pull-wire emergency stop switches**  
**1.5.3 EEx ZS 75 range**



**Actuating deflection/ force**

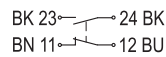
The values quoted relate to the switch being mounted at an ambient temperature of 20 °C. Stretching of the wire due to elongation and deformation of the wire thimbles has not been taken into account. The actuating forces given are only guide values, since the spring forces are subject to tolerances. Actuating deflections and forces relate to a 5 m long wire.



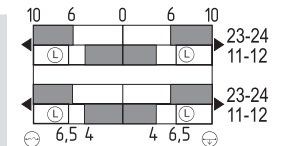
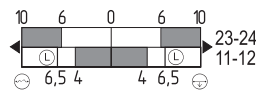
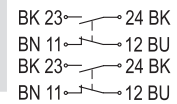
Pre-tensioning force [N]	Actuating deflection S [cm]	Actuating force F [N]	Recommended cable length [m]	Ordering suffix
295-390	12	60	30-50	-295N
195-275	12	41	20-30	-195N
120-180	12	25	10-20	-120N
80-100	12	8	<10	-80 N

**Contacts/ Switch travel**

**1 NO  
1 NC**



**2 NO  
2 NC**



Without latch interlock  
 Push button reset  
 Key reset

**EEx ZS 75 1Ö/1S**  
**EEx ZS 75 1Ö/1S VD**  
**EEx ZS 75 1Ö/1S VS**

**EEx ZS 75 2Ö/2S**  
**EEx ZS 75 2Ö/2S VD**  
**EEx ZS 75 2Ö/2S VS**

Without latch interlock, with watertight collar  
 Push button reset, with watertight collar  
 Key reset, with watertight collar

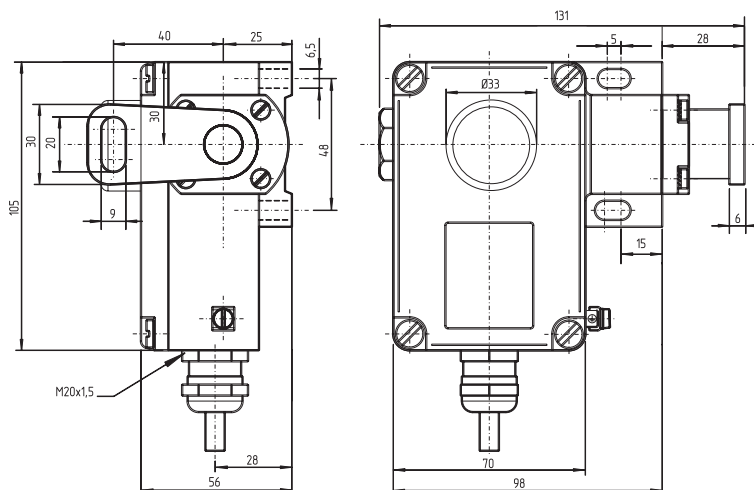
**EEx ZS 75 1Ö/1S W**  
**EEx ZS 75 1Ö/1S WVD**  
**EEx ZS 75 1Ö/1S WVS**

**EEx ZS 75 2Ö/2S W**  
**EEx ZS 75 2Ö/2S WVD**  
**EEx ZS 75 2Ö/2S WVS**

**Note** Ordering suffix for pretensioning force must always be added to part number, see ordering details.

**Ordering details** EEx ZS 75 range pull-wire emergency stop switch for one-side operation with two NO and two NC contacts, key reset and 120-180 N pretensioning force:  
 EEx ZS 75 2Ö/2S VS-120N

**1.** Ex switchgear  
**1.5** Safety switches  
**1.5.4** Pull-wire emergency stop switches  
**1.5.4** EEx ZS 73 S range



**Features**

- Metal enclosure
- 2 contacts
- II 2G EEx d IIC T6  
II 2D IP65 T80°C
- 4 spring force variants (pretensioning forces)
- Adjustable actuating force
- Wire up to 2 x 50 m long
- Reset by push button or key possible
- Pull-wire and wire-breakage functions

**Cable length**

- On the Ex pull-wire emergency stop switches, the cables are 3 m long
- Other lengths on enquiry

**Note**

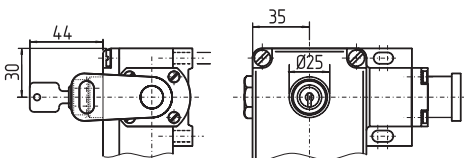
For tensioned span lengths over 4 m, intermediate wire supports are required, see accessories in chapter 1.5.6.

**Approvals**

EC Type test certificate:  
PTB 03 ATEX 1070 X\*

\*referring to the switch insert

**Key reset**



**Info**

Version for equipment category 3D (dust-Ex zone 22) available  
Ordering suffix: -3D

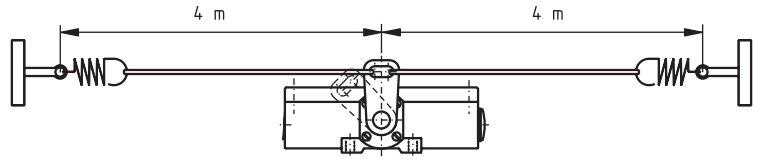
**3D version is equipped with wiring compartment.**

**1. Ex switchgear**  
**1.5 Safety switches**  
**1.5.4 Pull-wire emergency stop switches**  
**1.5.4 EEx ZS 73 S range**



**Actuating deflection/force**

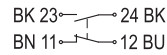
The values quoted relate to the switch being mounted at an ambient temperature of 20 °C. Stretching of the wire due to elongation and deformation of the wire thimbles has not been taken into account. The actuating forces given are only guide values, since the spring forces are subject to tolerances. Actuating deflections and forces relate to a 4 m long wire.



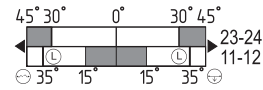
Actuating deflection S [cm]	Actuating force F [N]	Recommended cable length [m]
35	70	30-50

**Contacts/ Switch travel**

**1 NO**  
**1 NC**



Push button reset  
Key reset

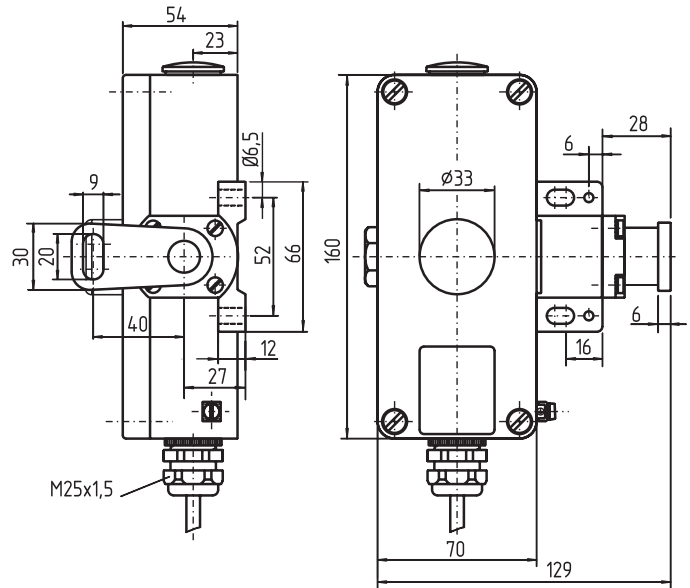


**EEx ZS 73 S 1Ö/1S VD**  
**EEx ZS 73 S 1Ö/1S VS**

**Ordering details**

EEx ZS 73 S range pull-wire emergency stop switch for two-side operation with one NO and one NC contact, key reset for wire lengths up to 2 x 50 m: EEx ZS 73 S 1Ö/1S VS

**1.** Ex switchgear  
**1.5** Safety switches  
**1.5.5** Pull-wire emergency stop switches  
**1.5.5** EEx ZS 75 S range



**Features**

- Metal enclosure
- 2 or 4 contacts
- II 2G EEx d IIC T6  
II 2D IP65 T80°C
- 4 spring force variants (pretensioning forces)
- Adjustable actuating force
- Twisting not possible
- Wire up to 2 x 50 m long
- Reset by push button or key possible
- Pull-wire and wire-breakage functions

**Cable length**

- On the Ex pull-wire emergency stop switches, the cables are 3 m long
- Other lengths on enquiry

**Note**

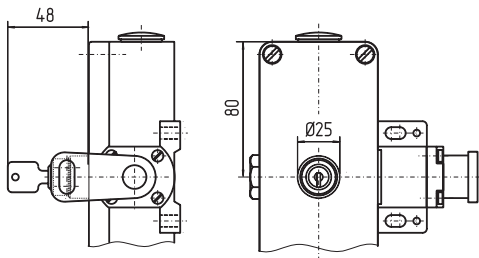
For tensioned span lengths over 4 m, intermediate wire supports are required, see accessories in chapter 1.5.6.

**Approvals**

EC Type test certificate:  
PTB 03 ATEX 1070 X\*

\*referring to the switch insert

**Key reset**



**Info**

Version for equipment category 3D (dust-Ex zone 22) available  
Ordering suffix: -3D

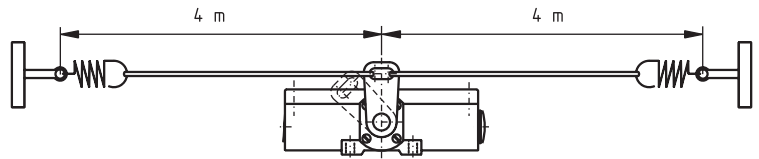
**3D version is equipped with wiring compartment.**

**1. Ex switchgear**  
**1.5 Safety switches**  
**1.5.5 Pull-wire emergency stop switches**  
**1.5.5 EEx ZS 75 S range**



**Actuating deflection/force**

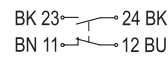
The values quoted relate to the switch being mounted at an ambient temperature of 20 °C. Stretching of the wire due to elongation and deformation of the wire thimbles has not been taken into account. The actuating forces given are only guide values, since the spring forces are subject to tolerances. Actuating deflections and forces relate to a 4 m long wire.



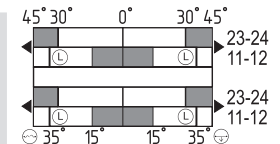
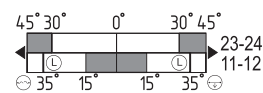
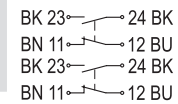
Actuating deflection S [cm]	Actuating force F [N]	Recommended cable length [m]
35	70	30-50

**Contacts/ Switch travel**

**1 NO  
1 NC**



**2 NO  
2 NC**



Without latch interlock  
 Push button reset  
 Key reset

**EEx ZS 75 S 1Ö/1S**  
**EEx ZS 75 S 1Ö/1S VD**  
**EEx ZS 75 S 1Ö/1S VS**

**EEx ZS 75 S 2Ö/2S**  
**EEx ZS 75 S 2Ö/2S VD**  
**EEx ZS 75 S 2Ö/2S VS**

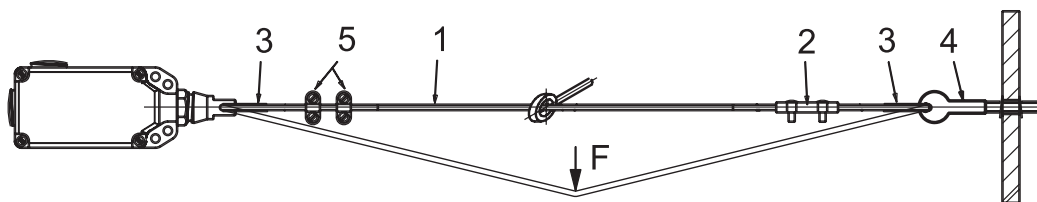
**Ordering details**

EEx ZS 75 S range pull-wire emergency stop switch for two-side operation with two NO and two NC contacts, key reset and for wire lengths up to 2 x 50 m: EEx ZS 75 S 2Ö/2S VS

1. Ex switchgear  
 1.5 Safety switches  
 1.5.6 Pull-wire emergency stop switches  
 1.5.6 Accessories

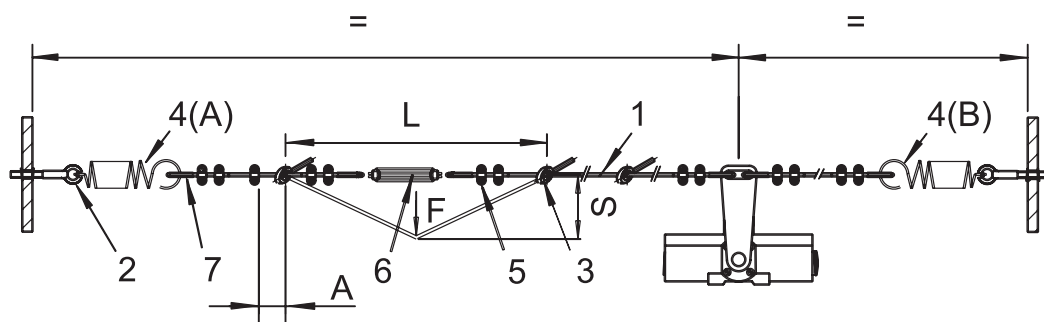


One-side operation



- Legend**
- 1 Wire rope with red PVC sheath
  - 2 Duplex wire clamp
  - 3 Wire thimble
  - 4 Eyebolt
  - 5 Wire clamp

Two-side operation

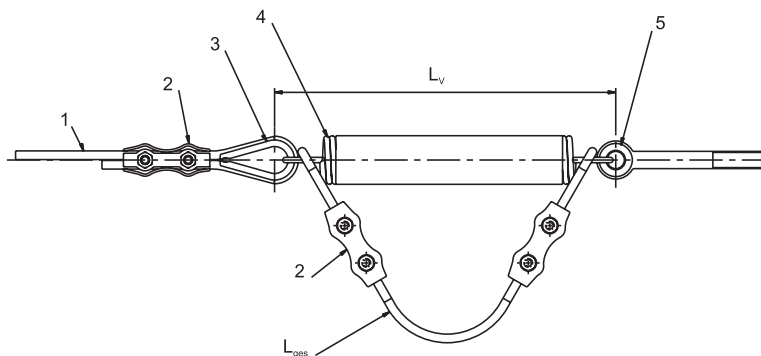


- Legend**
- 1 Wire rope
  - 2 Eyebolt
  - 3 Wire support
  - 4 Tension spring
  - 5 Wire clamp
  - 6 Tensioner
  - 7 Wire thimble
- Note**
- A Travel limit 70 mm
  - L Wire support max. 4 m
  - S Switching/actuating travel max. 400 mm (L = 4 m)
- Always mount pull-wire emergency stop switch in middle position.

Spring pretensioning and travel limitation

**Note**

In order to guarantee a safe operation, observe the enclosed mounting and wiring instructions. Before mounting the pull-wire the red PVC sheath must be removed from the pull-wire in the clamping range of the pull-wire.

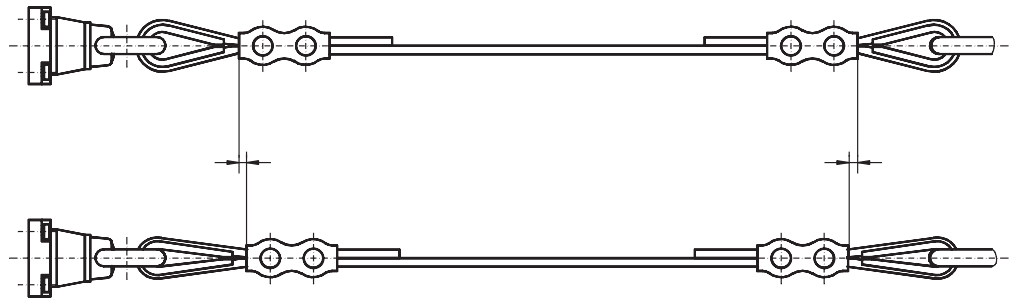


- Legend**
- 1 Pull-wire
  - 2 Duplex wire clamp
  - 3 Wire thimble
  - 4 Tension spring
  - 5 Eyebolt
  - 6 Tensioner
  - 7 Wire thimble
- $L_{ges}$  Total length for limitation of tension spring 270 mm
- $L_v$  Pre-tension 200 mm

- 1. Ex switchgear
- 1.5 Safety switches
- 1.5.6 Pull-wire emergency stop switches
- Accessories



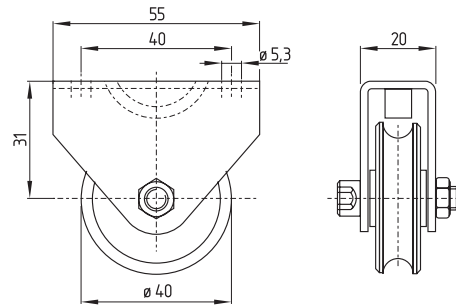
### Deformation of wire thimble



**Note** After fitting the wire, pull strongly on it several times, as the pull-wire and the wire thimble will deform. Subsequently retension the wire using the Duplex clamp, eye-bolt or tensioner.

### Pulley

- To guide the wire rope where the path is not a straight line
- For Ø 5 mm wire with red PVC sheath (steel core: Ø 3 mm)



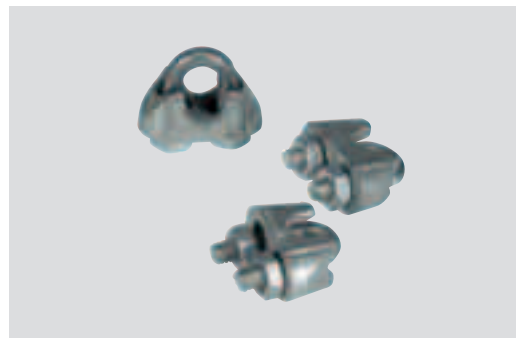
**Note** According to EN 418, pulleys may only be mounted such that the complete length of the pull-wire can be observed.

- 1. Ex switchgear
  - 1.5 Safety switches
  - 1.5.6 Pull-wire emergency stop switches
- Accessories**



### Wire clamp

- 3 mm wire clamp
- 5 mm wire clamp
- Also available in stainless steel
- Ordering unit: 1 piece



### Egg-shaped wire clamp

- For wire rope  $\varnothing$  3 mm steel core
- Ordering unit: 1 piece



### Duplex wire clamp

- Duplex wire clamp
- For wire rope  $\varnothing$  3 mm steel core
- Ordering unit: 1 piece



- 1. Ex switchgear
- 1.5 Safety switches
- 1.5.6 Pull-wire emergency stop switches
- Accessories



## Wire thimbles

- To DIN 6899
- For wire rope  $\varnothing$  3 mm steel core, ordering part number: Wire thimble 3B
- Also available in stainless steel
- Ordering unit: 1 piece



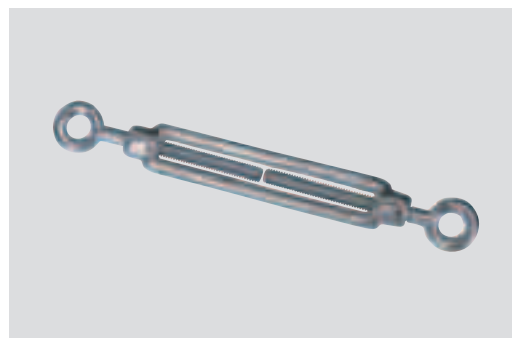
## Eyebolts

- To DIN 444
- Eyebolt M 8 x 70 including nut, length referring to eye centre: 70 mm, thread length: 25 mm, thread: M 8 x 1.5
- Also available in stainless steel
- Eyebolt BM 10 x 40 including nut (not shown) length referring to eye centre: 40 mm, thread: M 10 x 1.5
- Ordering unit: 1 piece



## Tensioner

- For exact adjustment of the tension of the wire rope
- To DIN 1480
- Tensioner M6: Adjustable from 145 mm to 225 mm
- Tensioner M8: Stainless steel, adjustable from 160 mm to 225 mm
- Also available in stainless steel
- Ordering unit: 1 piece

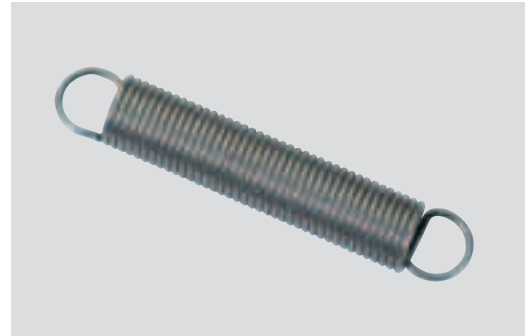


- 1. Ex switchgear
- 1.5 Safety switches
- 1.5.6 Pull-wire emergency stop switches
- 1.5.6 Accessories



## Tension spring

- Only suitable for two-side actuation
- To maintain the reaction force
- Ordering part number RZ-156I
- Length approx. 130 mm without tension
- Ordering unit: 1 piece



## Wire rope

- Steel core Ø 3 mm
- With red PVC sheath
- Ø 5 mm total
- Also available in stainless steel
- Ordering unit: per metre



## Wire rope set

- 5 m wire rope, steel core Ø 3 mm with 2 mm red PVC sheath
- 2 wire clamps DIN 741
- 1 wire thimble DIN 6899
- 1 eye-bolt DIN 444
- 1 Duplex wire clamp

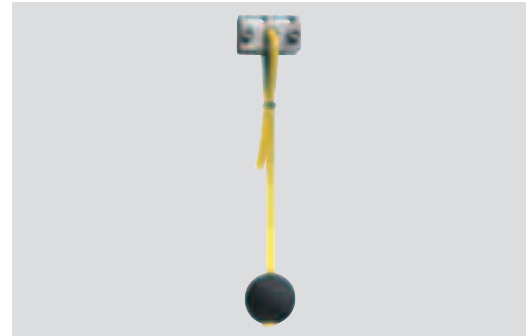


- 1.** Ex switchgear
- 1.5** Safety switches
- 1.5.6** Pull-wire emergency stop switches
- 1.5.6** Accessories



### Wire rope with ball

- Yellow wire rope (polypropylene)
- With ball and mounting clamp
- 1, 2, 3 or 5 m long
- Ordering unit: 1 piece



**1.** Ex switchgear  
**1.5** Safety switches  
**1.5.7** Pull-wire emergency stop switches  
**1.5.7** Technical data



	<b>EEx ZS 71</b>	<b>EEx ZS 73</b>	<b>EEx ZS 75</b>
Standards:	IEC 60947-5-1; EN 50014; EN 50018; EN 50281-1-1		
Ex marking:	⊕ II 2G EEx d IIC T6 II 2D IP65 T80°C		
Certification:	PTB 03 ATEX 1070 X*		
Enclosure:	Cast aluminium, enamel finish	Aluminium die-cast, enamel finish	
Cover:	Thermoplastic		Same like enclosure
Protection class:	IP 65 for versions with push button reset VD, WVD; IP 54 for versions with key reset VS, WVS to IEC/EN 60529		
Contact material:	Silver		
Switching insert:	1 x EX 14 VD	1 x EX 14 KU VD	1 x or 2 x EX 14 KU VD
Contact type:	Change-over contact with double break, NC contacts with positive break ⊖		
Switching system:	⊖ IEC 60947-5-1; slow action		
Termination:	Cable H05VV-F 4 x 0.75 mm <sup>2</sup>		
Rated impulse withstand voltage $U_{imp}$ :	4 kV		
Rated insulation voltage $U_i$ :	250 V		
Thermal test current $I_{the}$ :	6 A		
Utilisation category:	AC-15; DC-13		
Rated operating current/voltage $I_e/U_e$ :	6 A/250 VAC; 0.25 A/230 VDC		
Max. fuse rating:	6 A gL/gG D-fuse		
Ambient temperature:	-20 °C ... +65 °C		
Mechanical life:	> 1 million operations		



\* referring to the switch insert

**1. Ex switchgear**  
**1.5 Safety switches**  
**1.5.7 Pull-wire emergency stop switches**  
**1.5.7 Technical data**



	<b>EEx ZS 73 S</b>	<b>EEx ZS 75 S</b>
Standards:	IEC 60947-5-1; EN 50014; EN 50018; EN 50281-1-1	
Ex marking:	⊕ II 2G EEx d IIC T6 II 2D IP65 T80°C	
Certification:	PTB 03 ATEX 1070 X*	
Enclosure:	Aluminium die-cast, enamel finish	
Cover:	Thermoplastic	Same like enclosure
Protection class:	IP 65 for versions with push button reset VD; IP 54 for versions with key reset VS to IEC/EN 60529	
Contact material:	Silver	
Switching insert:	1 x EX 14 KU VD	1 x or 2 x EX 14 KU VD
Contact type:	Change-over contact with double break, NC contacts with positive break ⊖	
Switching system:	⊖ IEC 60947-5-1; slow action	
Termination:	Cable H05VV-F 4 x 0.75 mm <sup>2</sup>	
Rated impulse		
withstand voltage $U_{imp}$ :	4 kV	
Rated insulation voltage $U_i$ ; 250 V		
Thermal test current $I_{the}$ :	6 A	
Utilisation category:	AC-15; DC-13	
Rated operating		
current/voltage $I_e/U_e$ :	6 A/250 VAC; 0.25 A/230 VDC	
Max. fuse rating:	6 A gL/gG D-fuse	
Ambient temperature:	-20 °C ... +65 °C	
Mechanical life:	> 1 million operations	



\* referring to the switch insert