

Operating Instructions

Position Switch

> 8060/1



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2 General Information

2.1 Manufacturer

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2.2 Information regarding the Operating Instructions

ID NO.: 131382 / 8060603300
Publication Code: S-BA-8060/1-02-en-04/11/2008
We reserve the right to make technical changes without notice.

3 Safety Instructions

Use the position switch only for its intended purpose.

Incorrect or impermissible use or non-compliance with these instructions invalidates our warranty provision.


No changes to the device impairing its explosion protection are permitted. Mount the device only if it is clean and undamaged.

Observe the following when using the device:

- ▶ National safety regulations
- ▶ National accident prevention regulations
- ▶ National assembly and installation regulations
- ▶ Generally recognised technical regulations
- ▶ Safety instructions in these operating instructions
- ▶ Characteristic values and rated operating conditions on the rating and data plates
- ▶ Additional instruction plates on the device
- ▶ According to IEC/EN 61241-0, a device must not be operated with a dust layer exceeding 50 mm.

Replace the switch after each short circuit in the main circuit (the element is hermetically sealed and the state of the switching contacts cannot be checked).

Any damage can invalidate the Ex-protection!

| | |
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|  | On request, we will send you a copy of the EC type examination certificate with the relevant annex. |
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4 Conformity to Standards

The devices comply with the following standards and directives:

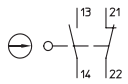
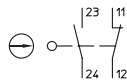
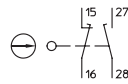
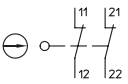
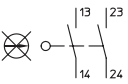
- ▶ Directive 94/9/EC
- ▶ IEC/EN 60079-0, IEC/EN 60079-1, IEC/EN 60079-7
- ▶ IEC/EN 61241-0, IEC/EN 61241-1
- ▶ EN 50047
- ▶ EN 60947

The devices are approved for use in hazardous areas zones 1, 2, 21 and 22.


5 Function

The type 8060/1 position switch comprises a flameproof switching element fitted into an increased safety enclosure. A choice of actuators is available. It is used to switch auxiliary, control and signal circuits in hazardous areas.

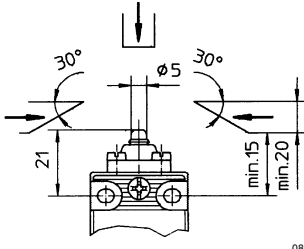
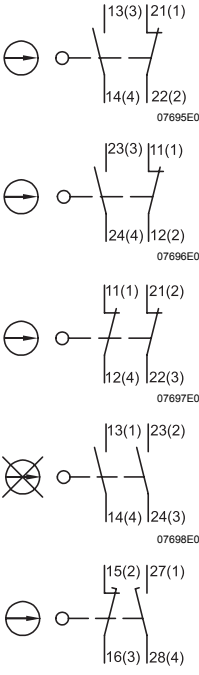
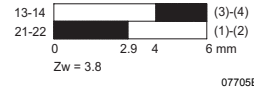
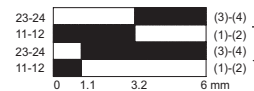
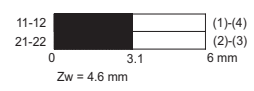
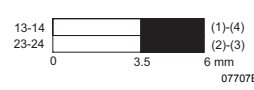
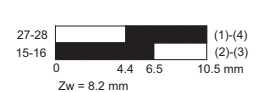
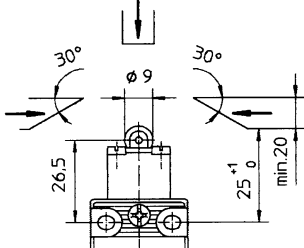
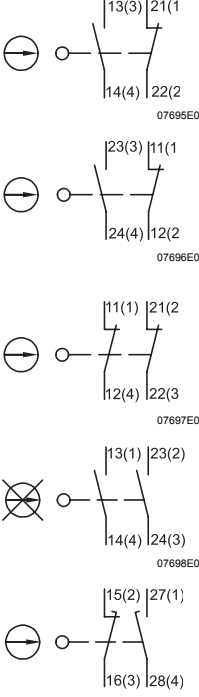

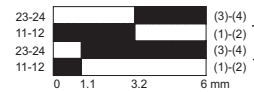
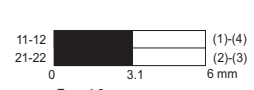
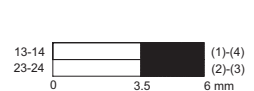

6 Technical Data

| | | | | |
|---------------------------------|---|--|--|---|
| Explosion protection | | | | |
| Gas explosion protection | | | | |
| ATEX | ⊕ II 2 G Ex de IIC T6 | | | |
| IECEX | Ex de IIC T6 | | | |
| Dust explosion protection | | | | |
| ATEX | ⊕ II 2 D Ex tD A21 IP65 T80 °C | | | |
| IECEX | Ex tD A21 IP65 T80 °C | | | |
| Certificates | | | | |
| Gas explosion protection | | | | |
| ATEX | PTB 01 ATEX 1052 | | | |
| IECEX | IECEX PTB 06.0091 | | | |
| Dust explosion protection | | | | |
| ATEX | PTB 01 ATEX 1052 | | | |
| IECEX | IECEX PTB 06.0091 | | | |
| Rated operational voltage U_e | 8060/1-1 8060/1-2 8060/1-5 | | 8060/1-3 8060/1-4 | |
| | Alternating current for equal potential: Alternating current for unequal potential: Direct current: | | max. 500 V max. 250 V 250 V | |
| Rated operational current I_e | max. 10 A: $-20\text{ °C} \leq T_a \leq +50\text{ °C}$ max. 6 A: $-20\text{ °C} \leq T_a \leq +70\text{ °C}$ | | | |
| Switching capacity | AC 12 | | AC 15 | |
| | 8060/1-1 8060/1-2 8060/1-5 | 8060/1-3 8060/1-4 | 8060/1-1 8060/1-2 8060/1-5 | 8060/1-3 8060/1-4 |
| | max. 250 V max. 500 V **) max. 10 A max. 5000 VA | max. 250 V max. 400 V **) max. 10 A max. 4000 VA | max. 250 V max. 500 V **) max. 10 A max. 1000 VA | max. 250 V max. 400 V **) max. 10 A max. 1000 VA |
| | **) Only for equal potential | | | |
| Rated insulation voltage | 550 V | | | |
| Rated impulse withstand voltage | 6 kV | | | |
| Short circuit protection | 10 A gL / gG | | | |
| Contact block | | | | |
| Version | Slow-action contact | Snap-action contact | Slow-action contact, make before break | |
| |  8060/1-1 08667E00 |  8060/1-2 08668E00 |  8060/1-5 08675E00 | |
| |  8060/1-3 08669E00 | Attention: The positive opening function ⊕ depends on the actuator used | | |
| |  8060/1-4 08670E00 | | | |

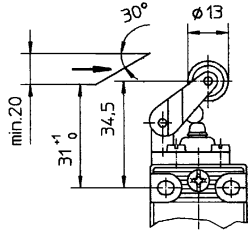
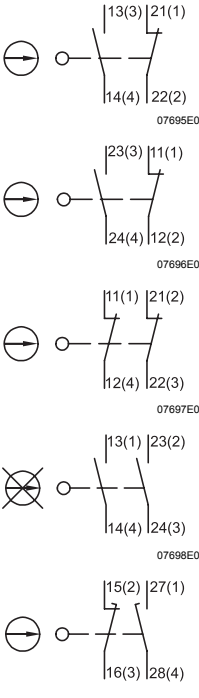
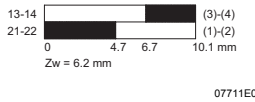
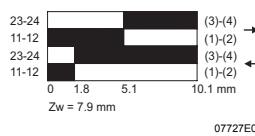
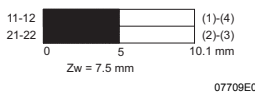
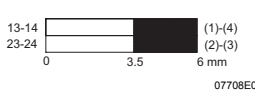
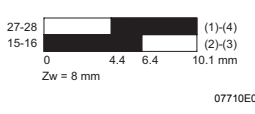
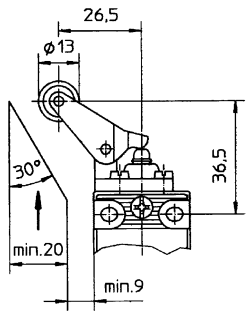
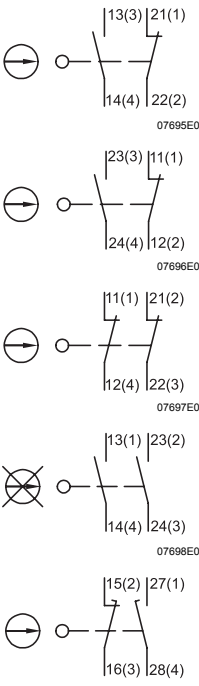
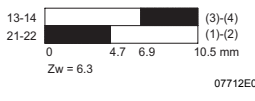
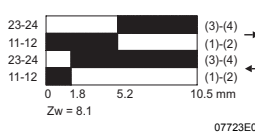
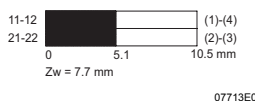
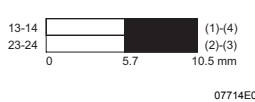
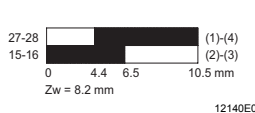
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|-----------------------------|--|--|
| Contact arrangement | 2-pole, galvanically isolated, with double break action | |
| Contact opening | ≥ 1.5 mm (isolating distance ≥ 3 mm) | |
| Contacts | Silver-nickel | |
| Service Life | | |
| mechanical | max. 10 ⁶ operations | |
| electrical | max. 10 ⁶ operations | |
| Enclosure contact | Polyamide, glass fibre reinforced | |
| Operating temperature range | - 20 °C ... + 50 °C (10 A) - 20 °C ... + 70 °C (6 A) | |
| Maximum switching frequency | max. 6000 operations/h | |
| Ingress protection | IP65 | |
| Enclosure material | Polyamide, glass fibre reinforced, black | |
| Cable glands | 8161/5-M 20-13 | |
| | at the bottom of the enclosure: | 1 x M 20 x 1.5 |
| Connection | With cable glands 8161: | For plastic sheathed cable 4 x 2.5 mm ² (diameter 6 ... 13 mm); recommended 4 x 1.5 mm ² |
| | With mounted connecting cable: | Plastic sheathed cable HK-SO-X05VV-F-OZ 4 x 1.5 mm, cable length 6 m |
| Terminals | 1 x 2.5 mm ² or 2 x 1 mm ² , single-wire / finely-stranded | |
| Mechanical shock resistance | Snap-action contact: | 2 g |
| | Slow-action contact: | 20 g |
| Tightening torque | Screw terminals: | max. 0.4 Nm |
| | Cover screws: | max. 0.7 Nm |
| | Connection thread: | 2.3 Nm (M 20 x 1.5) |
| | Pressure screw: | 1.5 Nm (M 20 x 1.5) |

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|  | If terminal sleeves are used, they must be gas-tight and applied with a suitable tool. |
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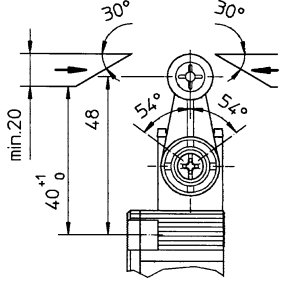
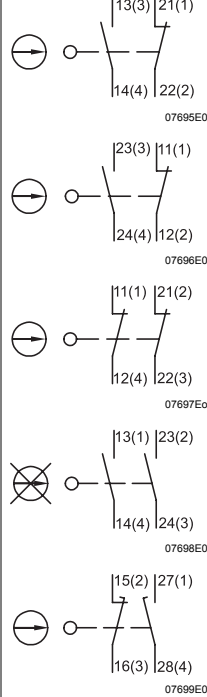
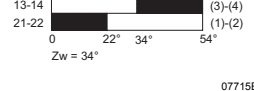
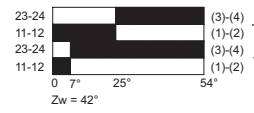
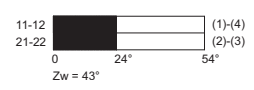
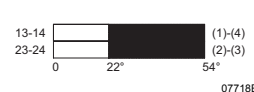
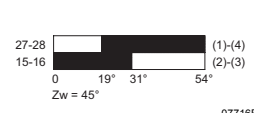
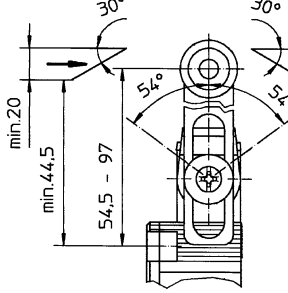
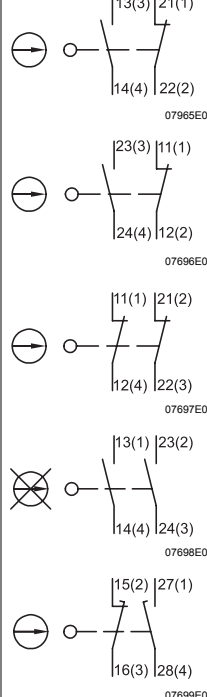
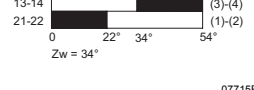
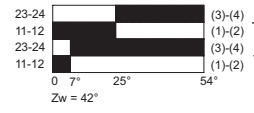
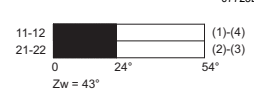
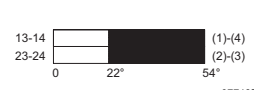
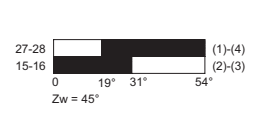
Operation, operating speed, contact travel or angle

| Actuator | Operation | Diagram | Nominal contact travels or angles | Minimum force/torque |
|--|---|---|--|----------------------|
| Type 8060/1 | <p>V = Max. operating speed → = Direction of operation () = Connection for device with unconnected cable end</p> | <p>⊕ = Positive opening</p> | <p>■ = Contact closed □ = Contact open Zw = Travel for positive opening</p> | |
| <p>Extended plunger 8060/1- . - S</p> |  <p>08086E00</p> <p>Lateral operation: V = 0.5 m/s</p> <p>Operation in stroke direction: V = 1.0 m/s</p> |  | <p>In stroke direction</p> <p>8060/1-1:  07705E01</p> <p>8060/1-2:  07722E01</p> <p>8060/1-3:  07706E01</p> <p>8060/1-4:  07707E01</p> <p>8060/1-5:  07704E01</p> | <p>14 N</p> |
| <p>Roller plunger 8060/1- . -RS</p> |  <p>08084E00</p> <p>Lateral operation: V = 1.0 m/s</p> <p>Operation in stroke direction: V = 1.0 m/s</p> |  | <p>In stroke direction</p> <p>8060/1-1:  07705E01</p> <p>8060/1-2:  07722E01</p> <p>8060/1-3:  07706E01</p> <p>8060/1-4:  07707E01</p> <p>8060/1-5:  07704E01</p> | <p>14 N</p> |

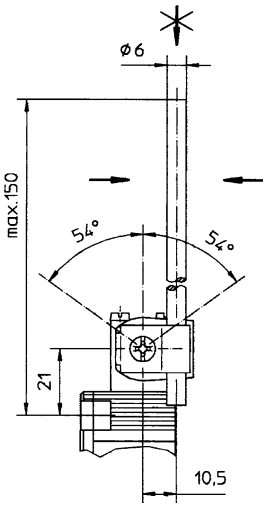
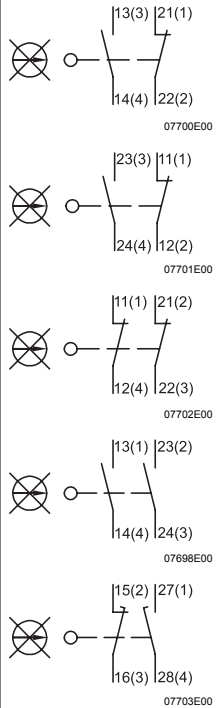
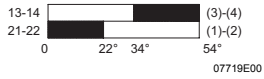
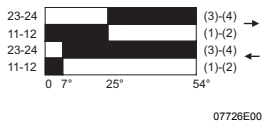
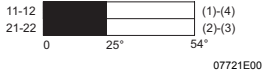
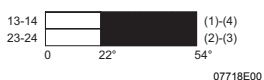

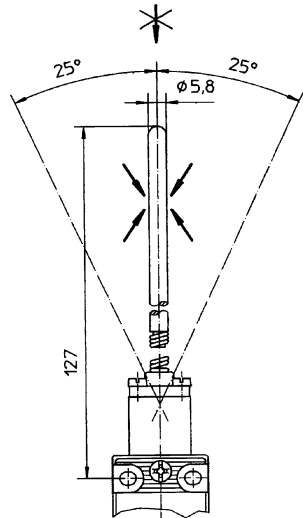
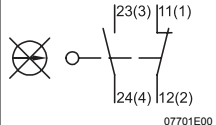
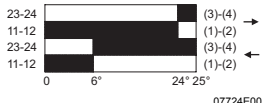
Operation, operating speed, contact travel or angle

| Actuator | Operation | Diagram | Nominal contact travels or angles | Minimum force/torque |
|--|--|---|---|----------------------|
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| <p>Roller lever plunger, form E 8060/1- . -AR</p> |  <p>V = 1.0 m/s</p> |  | <p>Movement of the roller in stroke direction of the plunger after plunger starts moving</p> <p>8060/1-1:  07711E01</p> <p>8060/1-2:  07727E01</p> <p>8060/1-3:  07709E01</p> <p>8060/1-4:  07708E01</p> <p>8060/1-5:  07710E01</p> | <p>12 N</p> |
| <p>Angled roller lever 8060/1- . -WR</p> |  <p>V = 1.0 m/s</p> |  | <p>Movement of the roller vertically to stroke direction of the plunger after plunger starts moving</p> <p>8060/1-1:  07712E01</p> <p>8060/1-2:  07723E01</p> <p>8060/1-3:  07713E01</p> <p>8060/1-4:  07714E01</p> <p>8060/1-5:  12140E01</p> | <p>12 N</p> |

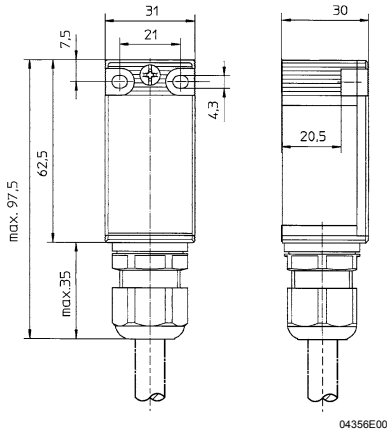
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|--|--|---|--|----------------------|
| Type 8060/1 | <p>V = Max. operating speed → = Direction of operation () = Connection for device with unconnected cable end</p> | <p>⊕ = Positive opening</p> | <p>■ = Contact closed □ = Contact open Zw = Travel for positive opening</p> | |
| <p>Swivelling roller lever, form A 8060/1- . -R</p> |  <p>V = 1.5 m/s</p> |  | <p>8060/1-1: </p> <p>8060/1-2: </p> <p>8060/1-3: </p> <p>8060/1-4: </p> <p>8060/1-5: </p> | <p>0.3 Nm</p> |
| <p>Adjustable roller lever 8060/1- . -V</p> |  <p>V = 1.5 m/s</p> |  | <p>8060/1-1: </p> <p>8060/1-2: </p> <p>8060/1-3: </p> <p>8060/1-4: </p> <p>8060/1-5: </p> | <p>0.3 Nm</p> |

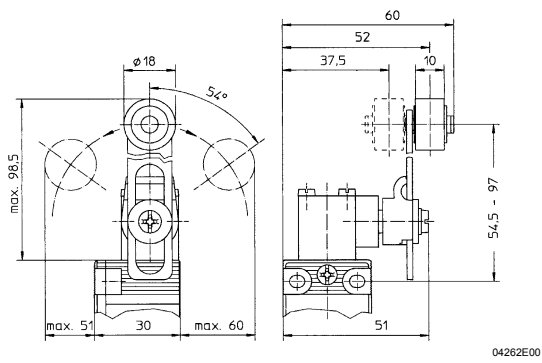
Operation, operating speed, contact travel or angle

| Actuator | Operation | Diagram | Nominal contact travels or angles | Minimum force/torque |
|--------------------------------|--|---|--|----------------------|
| Type 8060/1 | <p>V = Max. operating speed → = Direction of operation () = Connection for device with unconnected cable end</p> | <p>⊖ = Positive opening</p> | <p>■ = Contact closed □ = Contact open Zw = Travel for positive opening</p> | |
| Actuating rod 8060/1- . -H |  <p>V = 1.5 m/s No positive opening, not suitable for safety circuits</p> |  | <p>8060/1-1:  07719E00</p> <p>8060/1-2:  07726E00</p> <p>8060/1-3:  07721E00</p> <p>8060/1-4:  07718E00</p> <p>8060/1-5:  07720E00</p> | 0.3 Nm |
| Spring-rod actuator 8060/1-2-F |  <p>No positive opening, not suitable for safety circuits</p> |  | <p>Only for use with snap-action contact!</p> <p>8060/1-2:  07724E00</p> | - - |

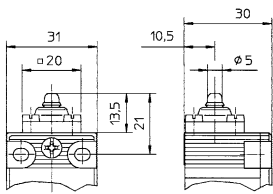
Dimensional Drawings (All Dimensions in mm) - Subject to Alterations



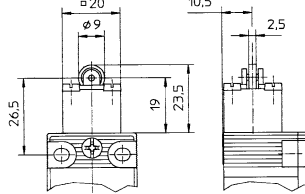
8060/1-.-OV
Position switch without insert



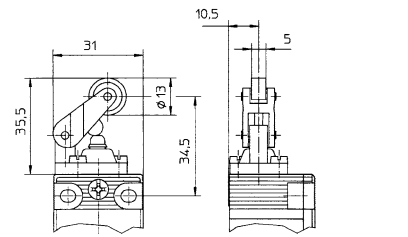
8060/1-.-V
Adjustable roller lever



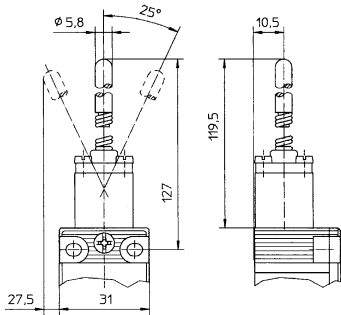
8060/1-.-S
Extended plunger



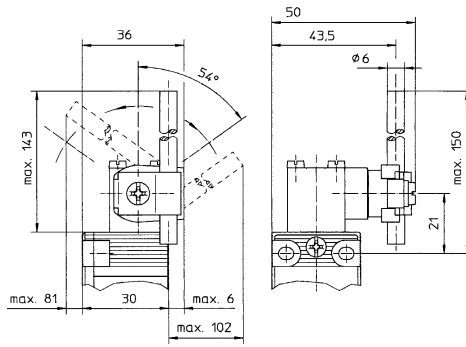
8060/1-.-RS
Roller plunger



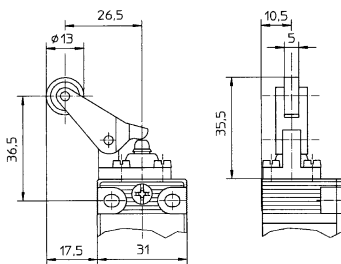
8060/1-.-AR
Roller lever, form E



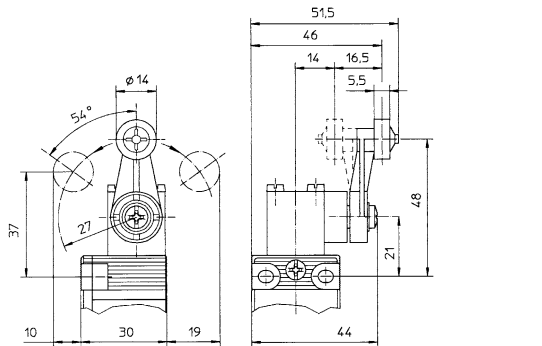
8060/1-2-F
Spring rod actuator



8060/1-.-H
Actuating rod



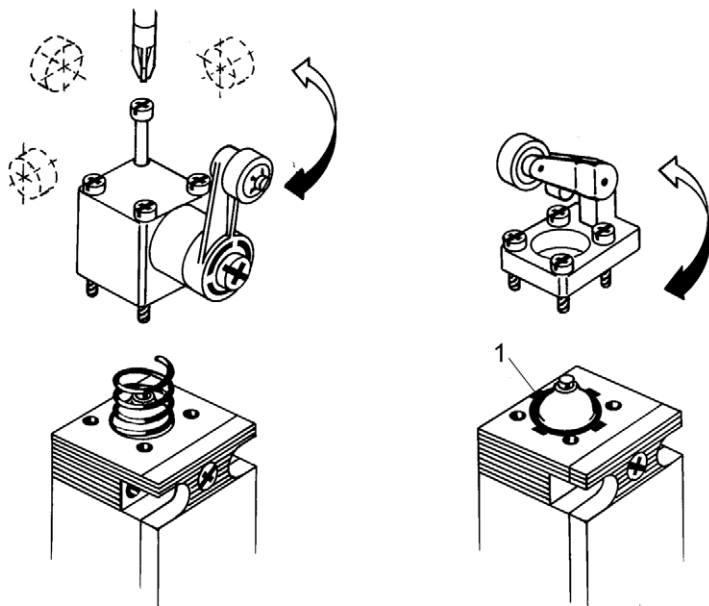
8060/1-.-WR
Angled roller lever



8060/1-.-R
Swivelling roller lever, form A

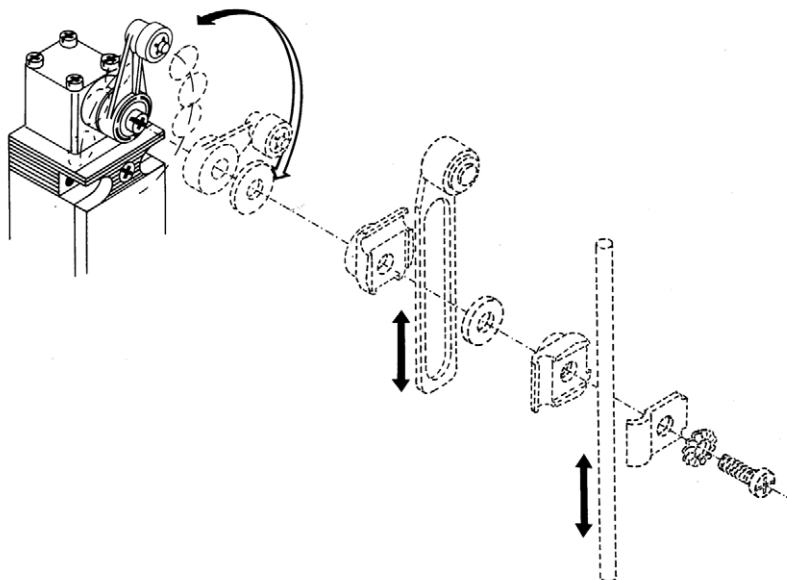
7 Assembly

Changing the actuator



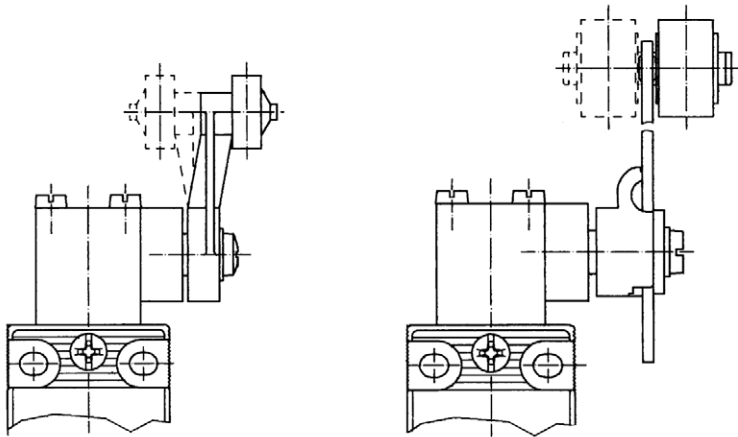
11437E00

► No frame (1) necessary for 8060/1-.-S. All other versions are with frame (1).
Adjusting the lever position



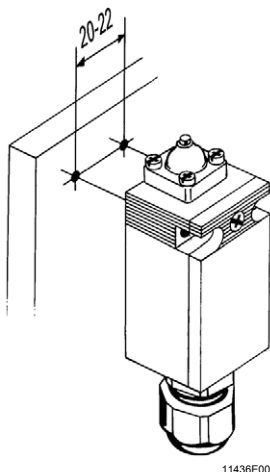
11438E00

Changing the roller lever position



11439E00

**Mounting the position switch using two screws, min. M 4 x 25;
tightening torque = 1.2 Nm**



11436E00



When explosion-protected electrical equipment is exposed to the weather, it is advisable to provide a protective cover or wall.

8 Transport and Storage

Transport and storage are only permitted in the original packing.

9 Installation

Mains Connection

- ▶ The conductors must be carefully connected.
- ▶ The conductor insulation must reach to the terminal. The conductor itself must not be damaged (nicked) when removing the insulation.
- ▶ Ensure that the maximum permissible conductor temperatures are not exceeded by suitable selection of cables and means of running them.
- ▶ Please also refer to the terminal details in the technical data.

Back-Up Fuse

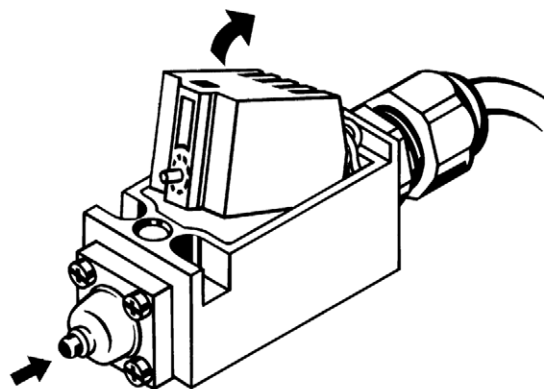
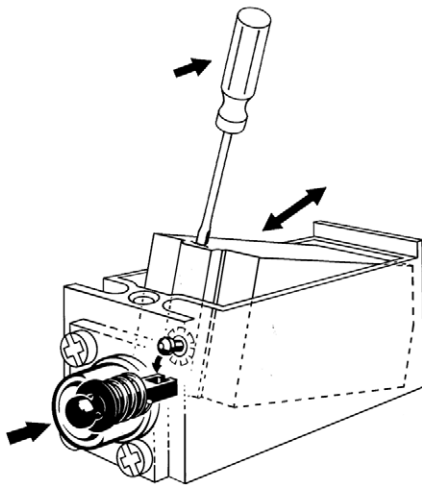
For short-circuit protection, a back-up fuse rated at max. 10 A with tripping characteristic gL/gG according to IEC 60269-1 may be used.

WARNING

Do not use position switch as a mechanical stop.
Secure the limit switch against position change by means of a locking device.

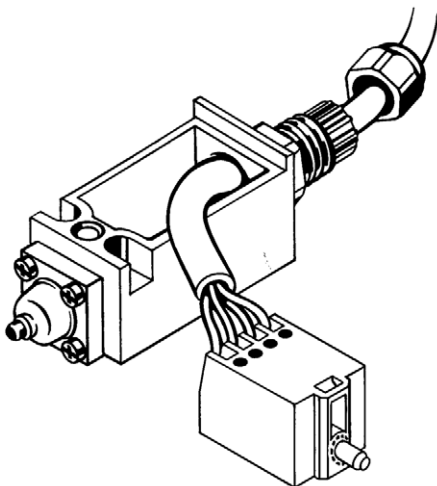
Instructions regarding cable connections and contact replacement

- ▶ Dismantle 35 mm of the wire and strip 6 mm of the conductor insulation.
- ▶ Open cover.
- ▶ Push the position switch until the stop.
- ▶ Use a screwdriver to remove the switching element (see sketch).



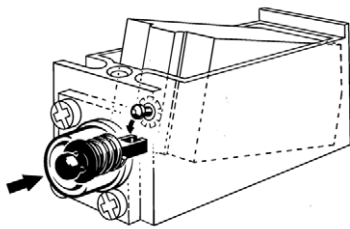
11440E00

- ▶ Insert the wire into the cable glands and connect it to the contact.



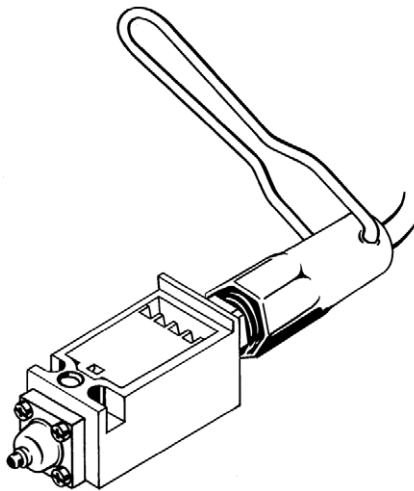
12059T00

- ▶ Only with 8060/1-2: Push the position switch until the stop.
- ▶ Insert the contact (see sketch) so that the denture of the rod engages into the contact groove.



12060T00

- ▶ Tighten the cable glands (tightening torque see "Technical Data").



114423E00

- ▶ Close cover.

10 Commissioning

Before commissioning the device, ensure that:

- ▶ the device has been installed according to the directions
- ▶ the device is not damaged
- ▶ connections have been made correctly
- ▶ all screws and nuts are fully tightened
- ▶ the terminal compartment is clean
- ▶ there are no foreign bodies inside the device
- ▶ the cables and wires have been inserted correctly
- ▶ the cable glands and stopping plugs are securely tightened
- ▶ no part of the flameproof enclosure is damaged

11 Maintenance and Servicing

Repairs and maintenance work on the devices may only be carried out by appropriately authorised and trained personnel.

Before work commences the devices must be disconnected from the mains.

 **WARNING**

Observe the relevant national regulations in the country of use!










The following points must be checked during maintenance:

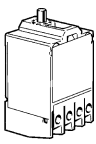
- ▶ clamping screw holding the cables is securely seated
- ▶ operating temperature
- ▶ cracks in plastic enclosures
- ▶ damage to the gaskets

12 Accessories and Spare Parts

! WARNING


Use only original spare parts as well as original accessories made by R. STAHL Schaltgeräte GmbH.

| Designation | Illustration | Order number | Weight kg |
|-------------|---|---|------------------------|
| Actuator |  05662E00 | Extended plunger 8060/1-0-S | 131251 0.016 |
| |  05663E00 | Roller plunger 8060/1-0-RS | 131254 0.019 |
| |  05664E00 | Roller lever plunger, form E 8060/1-0-AR | 131257 0.020 |
| |  05669E00 | Angled roller lever 8060/1-0-WR | 131272 0.021 |
| |  05665E00 | Swivelling roller lever, form A 8060/1-0-R | 131260 0.034 |
| |  05666E00 | Adjustable roller lever 8060/1-0-V | 131263 0.052 |
| |  05667E00 | Actuating rod 8060/1-0-H | 131266 0.045 |
| |  05668E00 | Spring-rod actuator 8060/1-0-F Only for use with snap-action contact! | 131269 0.034 |
| | Cable gland |  05664E00 | 8161/5-M 20-13 1 piece |

| Designation | Illustration | | | Order number | Weight kg | |
|-------------|---|-------------|---|--------------|--------------|-------|
| Contact |  | 1 NC + 1 NO | Slow-action contact | 8080/1-1 | 132529 | 0.025 |
| | | 2 NC | Slow-action contact | 8080/1-3 | 132532 | 0.025 |
| | | 2 NO | Slow-action contact | 8080/1-4 | 132533 | 0.025 |
| | | 1 NC + 1 NO | Slow-action contact, make before break | 8080/1-5 | 132534 | 0.025 |
| | | 1 NC + 1 NO | Snap-action contact | 8080/1-2 | 132531 | 0.025 |

13 Disposal

Observe the national standard for refuse disposal.

| | |
|---|---|
|  | We are pleased to answer any special questions you may have. Please contact your nearest R. STAHL representative. |
|---|---|

EG/EU-Konformitätserklärung
EC/EU Declaration of Conformity
Déclaration de Conformité CE/UE



R. STAHL Schaltgeräte GmbH • Am Bahnhof 30 • 74638 Waldenburg, Germany
 erklärt in alleiniger Verantwortung, *declares in its sole responsibility, déclare sous sa seule responsabilité,*

dass das Produkt: **Positionsschalter**
that the product: Position switch
que le produit: Interrupteurs de position

Typ(en), type(s), type(s): **8060/1**

mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt.
is in conformity with the requirements of the following directives and standards.
est conforme aux exigences des directives et des normes suivantes.

| Richtlinie(n) <i>Directive(s)</i> <i>Directive(s)</i> | | Norm(en) <i>Standard(s)</i> <i>Norme(s)</i> |
|---|---|---|
| Bis/Until/Jusque 2016-04-19: | Ab/From/De 2016-04-20: | EN 60079-0:2012+A1:2013 EN 60079-1:2014 EN 60079-7:2015 EN 60079-31:2014 |
| 94/9/EG: ATEX-Richtlinie | 2014/34/EU: | |
| <i>94/9/EC: ATEX Directive</i> | <i>2014/34/EU:</i> | |
| <i>94/9/CE: Directive ATEX</i> | <i>2014/34/UE:</i> | |

Kennzeichnung, marking, marquage:



II 2 G Ex db eb IIC Gb
II 2 D Ex tb IIIC T 80°C Db

CE 0158

EG-Baumusterprüfbescheinigung:
EC Type Examination Certificate:
Attestation d'examen CE de type:

PTB 01 ATEX 1052
 (Physikalisch-Technische Bundesanstalt,
 Bundesallee 100, 38116 Braunschweig, Germany, NB0102)

Produktnormen nach Niederspannungsrichtlinie:
Product standards according to Low Voltage Directive:
Normes des produit pour la Directive Basse Tension:

EN 60947-5-1:2004+A1:2009+AC:2004+AC:2005

Bis/Until/Jusque
2016-04-19:

Ab/From/De
2016-04-20:

EN 60947-5-1:2004+A1:2009+AC:2004+AC:2005

2004/108/EG: EMV-Richtlinie
2004/108/EC: EMC Directive
2004/108/CE: Directive CEM

2014/30/EU:
2014/30/EU:
2014/30/UE:

2011/65/EU RoHS-Richtlinie
2011/65/EU RoHS Directive
2011/65/UE Directive RoHS

EN 50581:2012

Spezifische Merkmale und Bedingungen für den Einbau siehe Betriebsanleitung.
Specific characteristics and how to incorporate see operating instructions.
Caractéristiques et conditions spécifiques pour l'installation voir le mode d'emploi.

Waldenburg, 2016-03-18

i.V.

Ort und Datum
Place and date
Lieu et date

Holger Semrau
Leiter Entwicklung Schaltgeräte
Director R&D Switchgear
Directeur R&D Appareillage

i.V.

J.-P. Rückgauer
Leiter Qualitätsmanagement
Director Quality Management
Directeur Assurance de Qualité