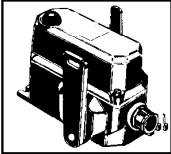
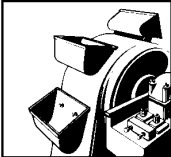
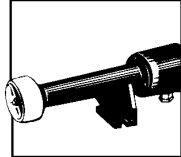
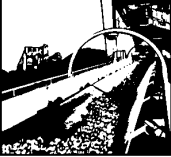
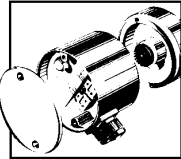


Belt misalignment switch Type HES and SEL



OPERATING INSTRUCTIONS

Legal Notice

Operating instructions (Translation of original)
Document No.: 94.063 388.191

Belt misalignment switch, Type HES and SEL
Equipment identification no.: various

Date of Issue: 27.10.2008
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CE conformity certificate

The device complies with the relevant European and national regulations.
CE conformity has been certified; the relevant records and documents are in the hands of the manufacturer.

Protective note (as per DIN ISO 16016:2002-5)

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1 For your safety

1.1 Intended use

The belt misalignment switches HES and SEL are used for monitoring the true running of continuous conveyors. The switches serve to protect the belts from being damaged or destroyed if the belt deviates from its designed running line. The device is intended for use in stationary installations and vehicles.

The documentation at hand is to be considered part of the product and must be retained and be available to the respective owner/user for the entire service life of the product. The documentation must be passed on to each subsequent owner of the product.

The manufacturer is **not liable** for personal injury and property damage arising from non-intended use of the device or unauthorized modifications to the device and its components. Make sure that the intended use is not impaired in any way even after unexpected outside influence on the device.

Intended use refers specifically to the operation of the device in accordance with these **operating instructions**. Work on this device may only be carried out by **qualified personnel** who are familiar with **accident prevention regulations** as well as other generally recognized safety regulations.

By using the equipment as intended, you protect yourself and prevent damage to the equipment and its components.

1.2 Design of warnings

Risks are classified in accordance with ISO 3864-2 and ANSI Z535.6 using the keywords

- “Danger,” “Warning,” and “Caution” in the case of bodily injury,
- “Beware” in the case of property damage, and
- “Note” to convey general information.

In this documentation, the Risks and Notes are classified and presented as follows:



indicates the immediate threat of danger. Not avoiding this danger will result in death or extremely serious injury (crippling).



Warning!

indicates a possibly dangerous situation. Not avoiding this dangerous situation could result in death or extremely serious injury (crippling).



Caution!

indicates a possibly dangerous situation. Failure to avoid this dangerous situation can result in light or minor injuries.



Beware!

indicates a possibly harmful situation. If this harmful situation is not avoided, the product or something in its vicinity could be damaged.



Note!

“Note” indicates advice on use and other especially helpful information.

Icons

The following icons are used to more clearly define the sources of danger. The icons can appear in reference to any level of danger.




| Icon | Type of danger |
|---|---|
|  | Dangers of all types, except those that are labeled with the following icon |
|  | Injuries caused by dangerous voltages and currents. |
|  | Damage caused by electrostatic discharges (ESD protection) |

Table 1-1: Icons for general sources of danger

2 Transport, storage and disposal

2.1 Transport and packaging

Select suitable packaging when sending the device or components of the device to Vossloh Kiepe GmbH, e.g. for repairs. In particular, ensure that the components are kept clean and protected from shock and moisture. This prevents damage to the components that may occur during transport, for which the manufacturer accepts no liability.

2.2 Storage

Avoid major temperature fluctuations, as these can lead to condensation that can cause damage to the device and its components.

Permissible storage temperature: see *Chapter 4: „Technical data”, page 10*



Damage caused by storage

Dirt or water getting into the device and exposure to weather (e.g. buildup of condensation in the device, sunlight) damage the device and lead to faster deterioration.

Protect the device by storing it in a clean, dry place under stable ambient conditions. If possible, store the device in its original packaging.

2.3 Disposal

Only materials that are not considered hazardous according to current engineering practice are used for Vossloh Kiepe GmbH products. Furthermore, we develop products that can be recycled after intended use. In our selection of raw materials and components, we favor reusable materials. This choice of materials used does not compromise product safety in any way.

3 Description

Belt misalignment switches are used in conveyor belt systems subjected to especially severe operating conditions for monitoring the true running of continuous conveyors (see section 1.1: „Intended use“, page 5). The belt misalignment switches serve to protect the belts from being damaged or destroyed if the belt deviates from its designed running line. Upstream systems can be stopped in time to avoid material spillage or operational malfunctions.

The roller lever (3) of the belt misalignment switch is made of stainless steel and contains ball bearings for improved handling of lateral forces and impacts. The 48 mm roller diameter means the device can be used at high belt speeds. All external parts are either made of stainless steel or have a special galvanized coating.

The roller lever (3) of the belt misalignment switches can be moved in both directions (see fig. 3-1). By moving the roller lever (3) the cam discs (11) are turned (see fig. 3-2). The cam discs (11) operate the switches (7). The cam discs (11) are adjustable and make it possible to adapt the switch points to local conditions.

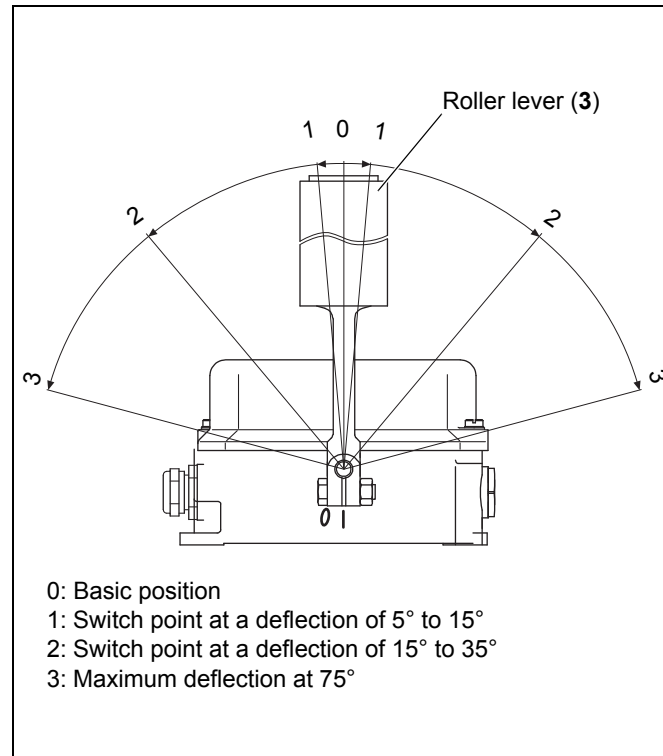


Fig. 3-1: Belt misalignment switch - switch points (adjustable)

The belt misalignment switch, for example, can be adjusted in such a way that when it reaches the first switch point, an advance warning (adjustment range: 5° to 15°) is triggered and when it reaches the second switch point, the conveyor belt system is switched off (adjustment range: by prying out a cam by 15° to 35°). The mechanical stop of the roller lever (3) is reached at a deflection of 75° .

Belt misalignment switches are mounted in pairs on the upper belt in front of the drive roller, on the lower belt in front of the deflection roller and also on critical spots where the axis distances are larger or material is transferred (see fig. 3-3).

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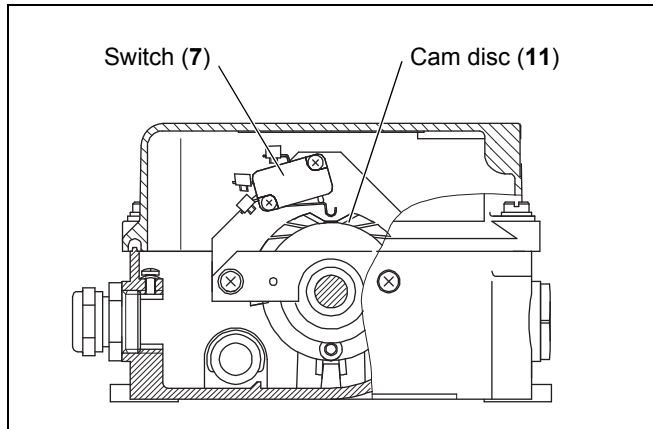


Fig. 3-2: Belt misalignment switch – view with roller lever removed

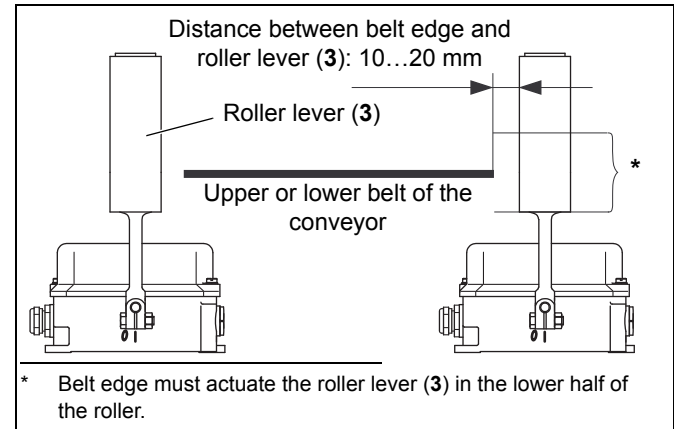


Fig. 3-3: Paired belt misalignment switches mounted on the conveyor

4 Technical data

4.1 General technical data

| | |
|--|---|
| In compliance with the following standards and regulations | EN 60947-5-1 VDE 0110 – Pollution degree 2 (inside), 4 (outside) |
| Suitable for | Controls and installations according to EN 60204 |
| Casing | HES: Aluminum, SEL: Gray cast iron |
| Mounting | HES: two slotted holes for M 8 screws SEL: two slotted holes for M 10 screws |
| Permissible ambient temperature | - 25 °C to + 70 °C, <i>see also Section 4.3, page 12</i> |
| Permissible storage temperature | - 25 °C to + 70 °C, <i>see also Section 4.3, page 12</i> |
| Max. altitude above sea level | 2.000 m (contact manufacturer for installation on sites at higher altitudes) |
| Protection standard | IP 67 according to EN 60529 |
| Switching system | Snap-acting switch, max. four positive-opening change-over contacts, <i>see also Section 4.3, page 12</i> |
| Type of drive | Cylindrical roller made from stainless steel, Ø 48 mm |
| Switch points | Adjustable: 5° to 15° and 15° to 35° Default setting: 2 x 10° |
| Deflection of the roller lever | Max. 75° |
| Rated insulation voltage U_i | AC 380 V, DC 250 V |
| Conventional thermal current I_{th} | 6 A |
| Breaking capacity | AC-15: $U_e = AC 230 V$, $I_e = 1.5 A$ DC 24 V, $t = 2 ms$ to $3 ms$, to 3 A |

| | |
|---------------------------------|---|
| Conductor infeed | Tapped hole for 2 x M25 x 1.5 1 x screwed cable gland M25 x 1.5; sealing area Ø 11 mm to Ø 16 mm 1 x dummy plug M25 x 1.5 |
| Line connection cross-section | 0,75 mm ² to 1.5 mm ² |
| Protective conductor connection | In the casing, M4, protective conductor cross-section max. 2.5 mm |
| Weight | HES: approx. 1820 g SEL: approx. 5500 g |

4.2 Device identification

The devices are marked with a device identification number consisting of an 8-digit basic number and a 3-digit variant number:

| Type | Basic number | Variant number |
|------|--------------|--------------------------|
| HES | 92.057020. | see section 4.3, page 12 |
| SEL | 92.056979. | see section 4.3, page 12 |

You will find the exact type and variant number on the rating plate on the exterior of the casing.

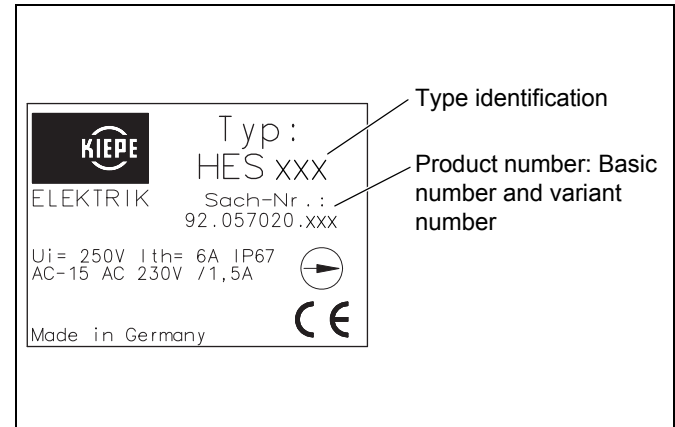


Fig. 4-1: Printed impression

4.3 Device variants¹

| Variant number | Type | Technical data (see section 4.1) |
|----------------|--|--|
| 0xx, 1xx | Basic device without/with signal lamp | – |
| 2xx | Basic device with DUPLINE module | also see the "DUPLINE module for belt misalignment switches" operating instructions: HES 21x: 94.063896.191 HES 22x, HES 23x: 94.063897.191 SEL 21x: 94.063898.191 SEL 22x, SEL 23x: 94.063899.191 |
| 3xx | Basic device | additional screwed cable gland |
| 4xx | Basic device | additional switch configuration |
| 5xx | Basic device with UL approval | UL approval |
| 6xx | Roller lever limit switch | See operating instructions 94.062556.191 |
| 7xx | Basic device with expanded temperature range | HES 711: - 40 °C to + 80 °C |
| 8xx | – | – |
| 9xx | Special devices | – |

1. Deviations are possible for certain types.

4.4 Dimensions

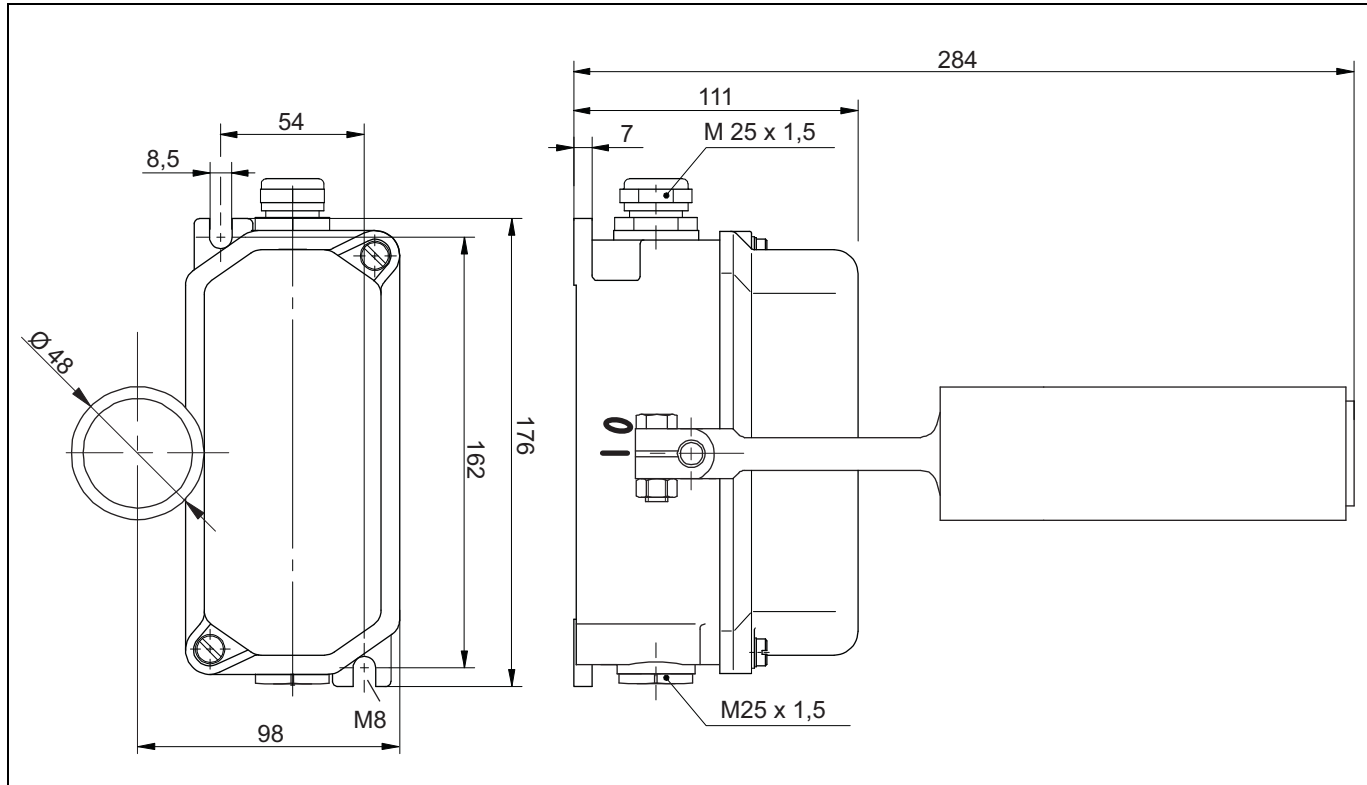


Fig. 4-2: HES dimensions

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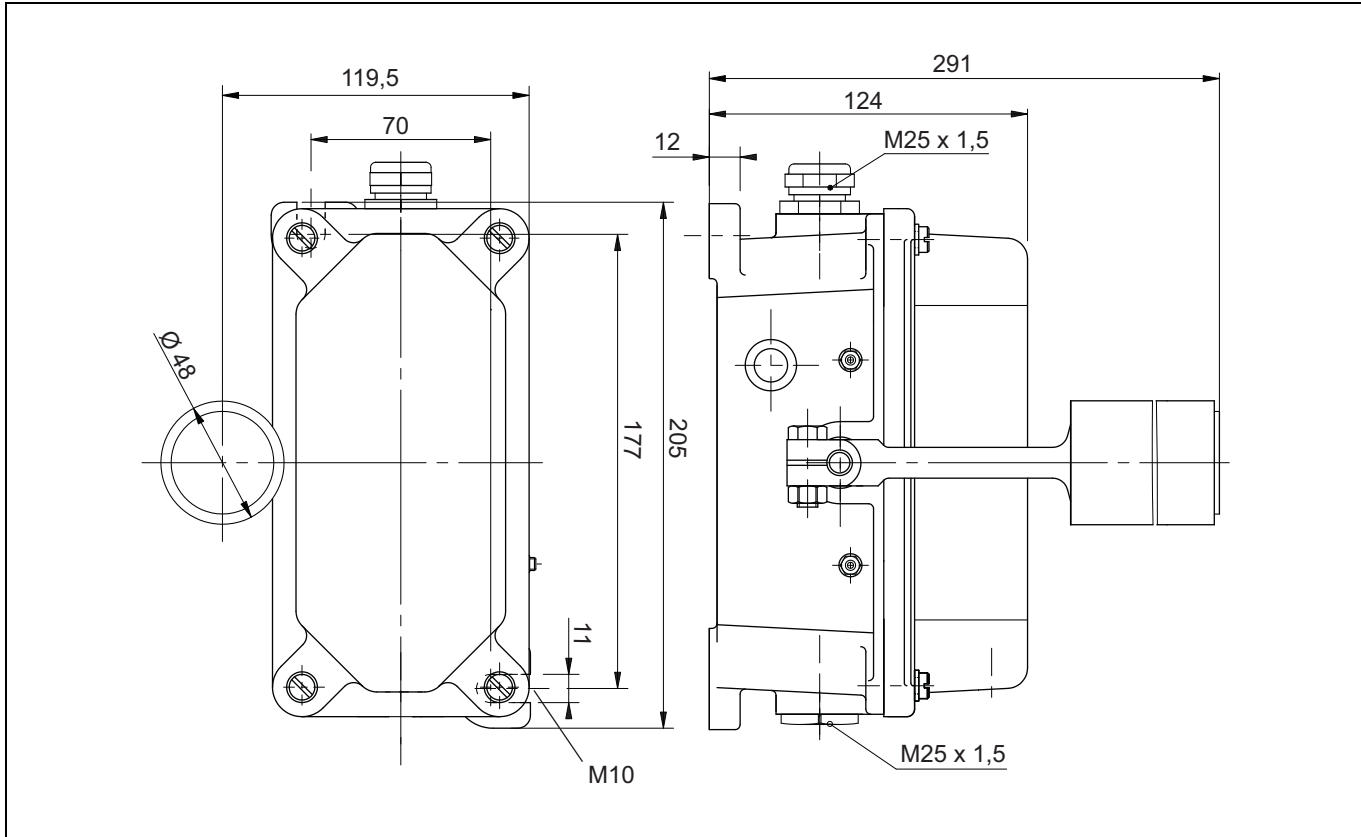


Fig. 4-3: SEL dimensions

5 Mounting and dismounting

5.1 Scope of delivery

The belt misalignment switches are delivered ready to operate. The screws for mechanical fastening are not included in the scope of delivery.

One screwed cable gland (6) and one dummy plug (25) are included in the scope of delivery (see fig. 5-1).



Beware!

The device must only be operated when all three holes are closed with the supplied cable gland (6) and the dummy plug (25). Only use the supplied screwed cable gland (6) and dummy plugs (25), otherwise the seal can no longer be guaranteed.

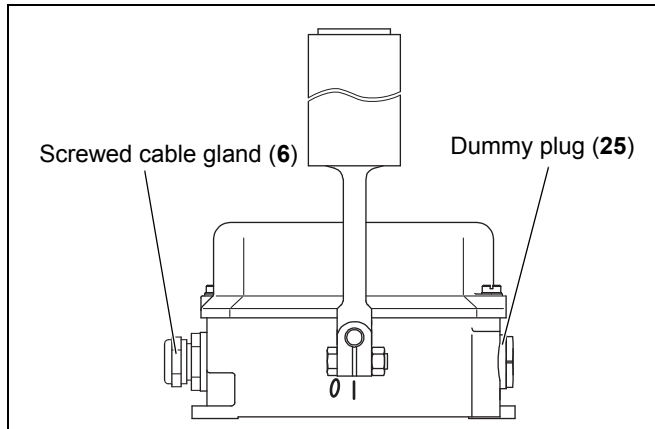


Fig. 5-1: Scope of delivery

5.2 Mounting



Danger of fatal electric shock

Work on the device may be performed only by a qualified electrical technician.

Prior to working, switch off the power supply to the system. Ensure that the system cannot be accidentally switched on. Mask any neighboring components that may be live to prevent contact.



Beware!

The belt misalignment switches are to be used in control circuits only.



Beware!

The device must only be operated when all three holes are closed with the supplied cable gland (6) and the dummy plug (25). Only use the supplied screwed cable gland (6) and dummy plugs (25), otherwise the seal can no longer be guaranteed.

5.2.1 Mechanical mounting



Beware!

Make sure to mount the belt misalignment so that the belt edge actuates the roller lever (3) in the lower half of the roller when the belt deviates from its designed running line. This prevents the belt from sliding over the roller lever (3) (see fig. 5-2).

Belt misalignment switches are mounted in pairs on the upper belt in front of the drive roller, on the lower belt in front of the deflection roller and also on critical spots

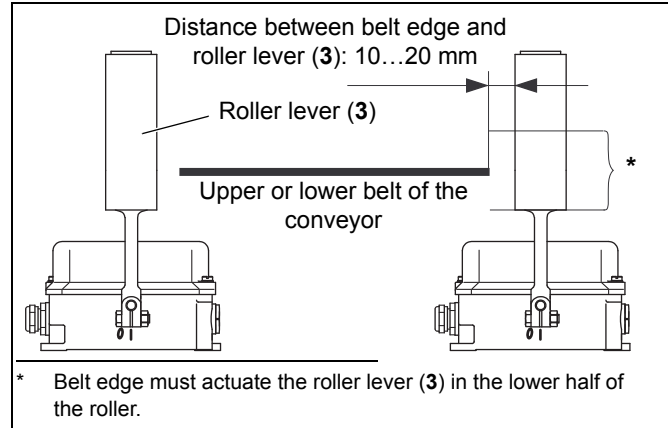


Fig. 5-2: Mounting paired belt misalignment switches on the conveyor

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where the axis distances are larger or material is transferred (see fig. 5-2).

1. Prior to working, switch off the power supply to the system. Ensure that the conveyor system cannot be accidentally switched on. Mask any neighboring components that may be live to prevent contact.
2. Secure the belt misalignment switches on the conveyor structure (see section 4.4: „Dimensions“, page 13). Secure the belt misalignment switches by screwing two screws through the long holes (10) (see fig. 5-3).

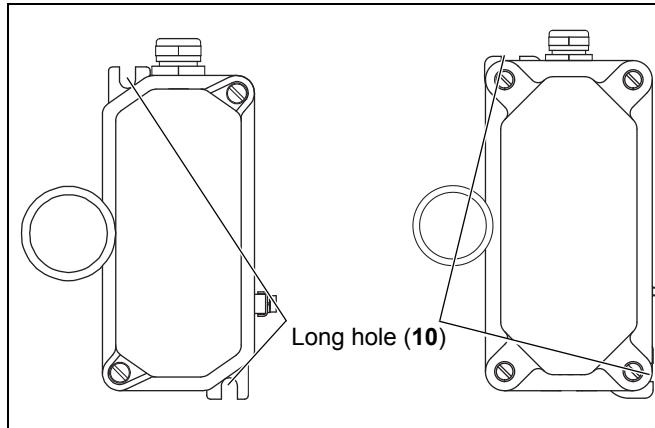


Fig. 5-3: Mounting the belt misalignment switch onto the conveyor

In order to minimize roller lever (3) wear, mount the roller lever (3) in such a way that it is located approximately 10 to 20 mm in front of the belt edge (see figures 5-2 and 5-4).

3. Fit the roller lever (3) onto the shaft (14).

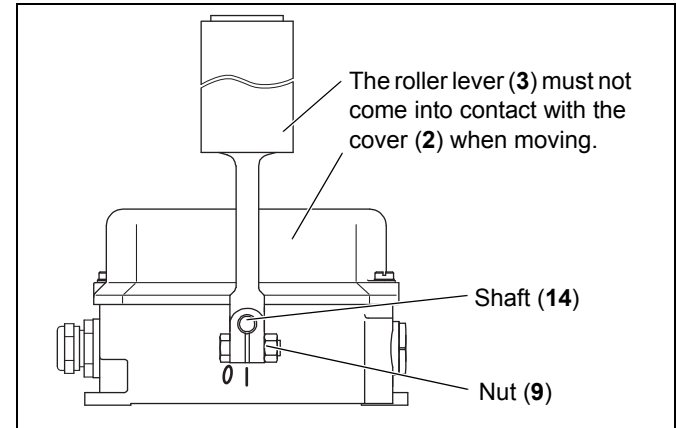


Fig. 5-4: Mounting the roller lever on the belt misalignment switch

**Beware!**

When tightening the nut (9), make sure the distance to the cover (2) is sufficient enough so that the roller lever (3) will not come into contact with the cover (2) when the roller lever (3) is moving.

4. Set the roller lever (3) to the required position and retighten the self-locking nut (9).

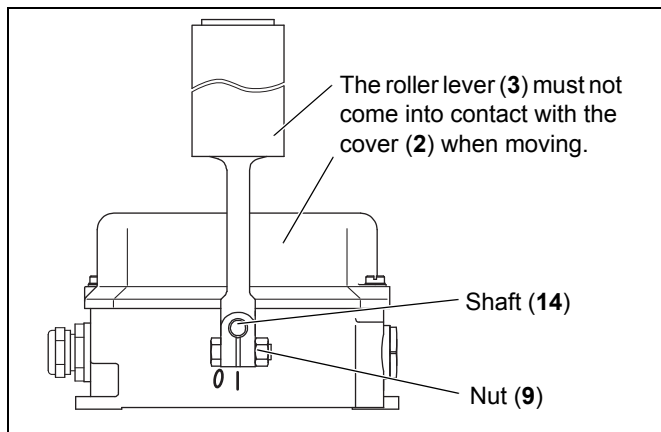


Fig. 5-5: Mounting the roller lever on the belt misalignment switch

5.2.2 Electrical connection**Danger of fatal electric shock**

Work on the device may be performed only by a qualified electrical technician.

Prior to working, switch off the power supply to the system. Ensure that the system cannot be accidentally switched on. Mask any neighboring components that may be live to prevent contact.

**Danger!**

Only use connection cables with a diameter of at least 11 mm up to a maximum of 16 mm. The permissible conductor cross-sections can be found in *Chapter 4: „Technical data“, page 10.*

**Penetration of dirt and water when gaskets are damaged**

If gaskets are damaged, dirt and water can penetrate into the device and damage the device and its components.

Check gaskets for damage before assembling. If the gasket is damaged, exchange the device cover.

1. Prior to working, switch off the power supply to the system. Ensure that the conveyor system cannot be accidentally switched on. Mask any neighboring components that may be live to prevent contact.
2. Open the cover (2) of the belt misalignment switch by loosening the two screws (5).
3. Loosen the nut on the screwed cable gland (6) and thread the connection cable (\varnothing 11 mm to \varnothing 16 mm) through it (see fig. 5-6).
4. Connect the connection cable to the terminals of the switch (7) in the cover (2) of the belt misalignment

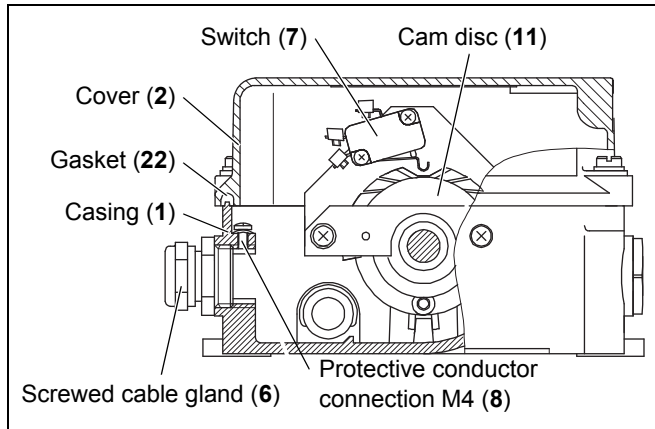


Fig. 5-6: View of the belt misalignment switch connections

switch according to the connection diagram (see fig. 5-7).

5. Attach the protective conductor (max. 2.5 mm²) to protective conductor connection M4 (8) (conductor cross-sectional area depending on supply line, subject to a maximum of 2.5 mm²).

The factory setting for the switch points of the belt misalignment switches is 10° in both directions. The switch points of the belt misalignment switches can be adjusted as required.

6. Adjust the switch point of the roller lever (3) on the cam disc (11), if a different switch point is required

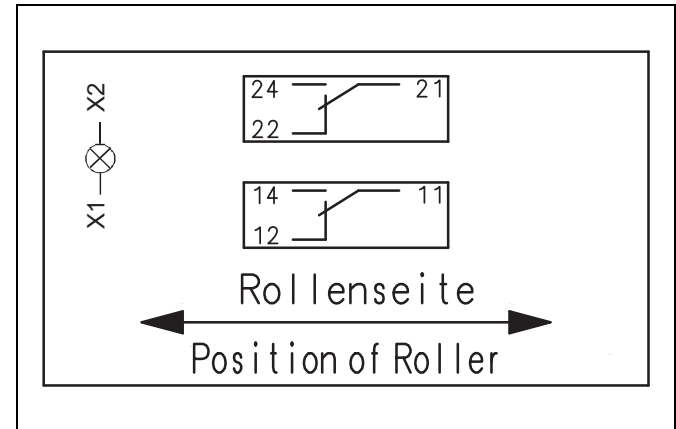


Fig. 5-7: Connection diagram in the belt misalignment switch cover

(see section 5.2.3: „Adjusting the switch points“, page 21).

7. Tighten the nuts of the screwed cable gland (6) with a **tightening torque of 6.7 Nm**.

**Beware!**

A device with a damaged gasket (22) must not be used. Remove any dust that may have entered the casing (1).

8. Check the gasket (22) of the cover (2) for damage.
9. Close the cover (2) of the belt misalignment switch.

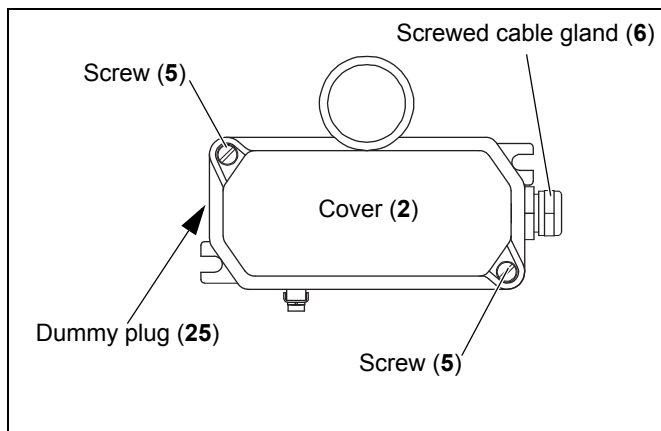


Fig. 5-8: Mounting the belt misalignment switch onto the conveyor

10. Secure the cover (2) with the screws (5). Tighten the screws (5) **evenly** with a **tightening torque of 1.5 Nm**.
11. Put the belt misalignment switch into operation (see section 5.2.4: „Commissioning“, page 23).

5.2.3 Adjusting the switch points

The factory setting for the switch points of the belt misalignment switches is 10° in both directions. The "Advance Warning" and "Switch Off" switch points can be adjusted as required.

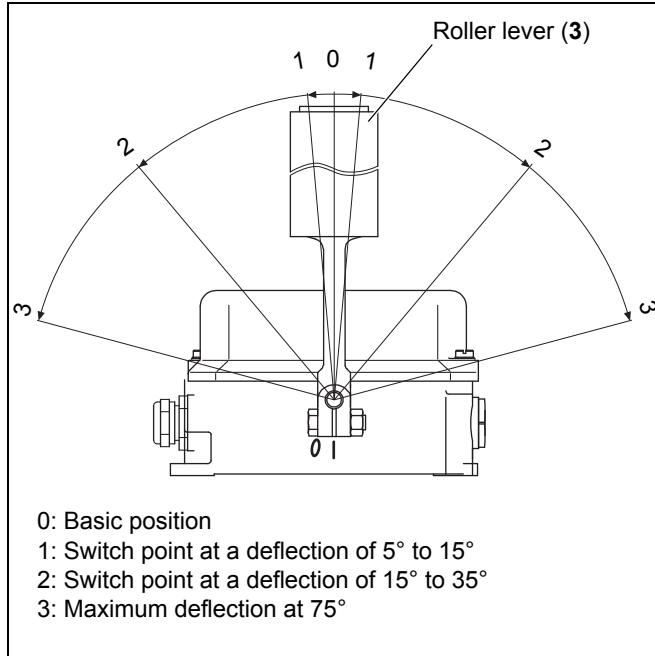


Fig. 5-9: Adjusting the switch points



Danger of fatal electric shock

Work on the device may be performed only by a qualified electrical technician.

Prior to working, switch off the power supply to the system. Ensure that the system cannot be accidentally switched on. Mask any neighboring components that may be live to prevent contact.

1. Prior to working, switch off the power supply to the system. Ensure that the conveyor system cannot be accidentally switched on. Mask any neighboring components that may be live to prevent contact.
2. Open the cover (2) of the belt misalignment switch by loosening the two screws (5) (see fig. 5-8).



Note

There are two screws (15) in each of the two cams (11) (see figure 5-10, page 22). With one screw (15), the cam (11) is fixed in its basic setting. The second screw (15) is screwed into the cam (11).

To adjust the cam (11), the first screw (15) is loosened just enough that the cam (11) can be turned. The screw (15) can remain in the device. After being adjusted, the cam (11) is fixed with the second screw (15).

Especially with small changes in the setting, this prevents the cam (11) from being turned back to its original position when the screw (15) is tightened.

3. Adjust the switch point 1 (advance warning) (see figures 5-9 and 5-10).

Adjustment range: 5° to 15°

- Loosen the screw (15) in the cam (11) enough that you can turn the cam (11).
- Adjust the switch point 1 (advance warning) by turning the cam (11).

- Tighten the second screw (15) so that the cam (11) is fixed in the newly set position.
4. Adjust the switch point 2 (switch off).

Adjustment range: 15° to 35°

- Pry the cam (11) out of the cam disc (12) to obtain a larger adjustment range.
- Loosen the screw (15) in the cam (11) enough that you can turn the cam (11).
- Adjust the switch point 2 (switch off) by turning the cam (11).

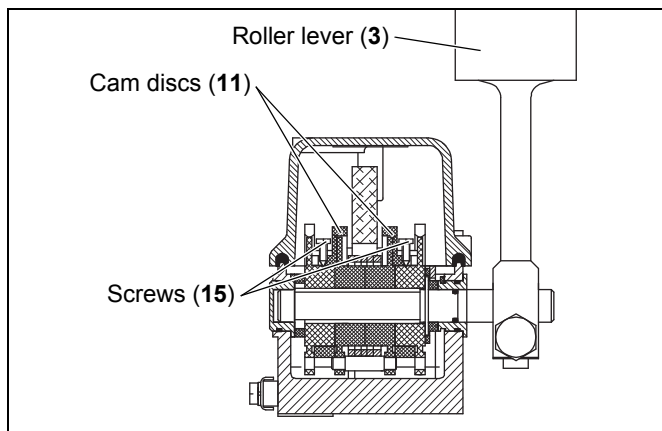


Fig. 5-10: Adjusting the switch points – Loosening screws in the cam disc

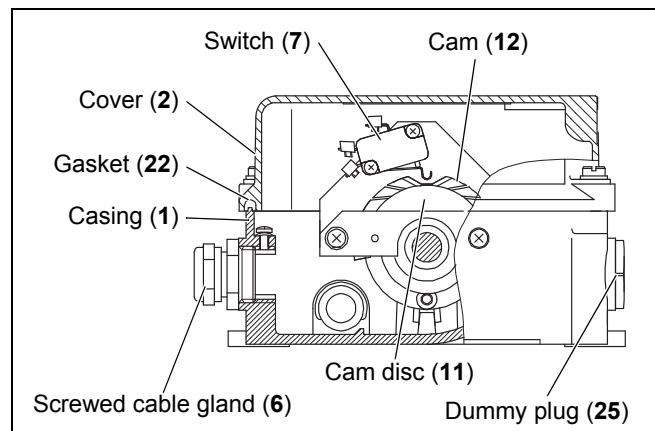


Fig. 5-11: View of the belt misalignment switch connections

- d. Tighten the second screw (15) so that the cam (11) is fixed in the newly set position.
5. Check the set switch points (see figure 5-9, page 21).



Beware!

A device with a damaged gasket (22) must not be used. Remove any dust that may have entered the casing (1).

6. Check the gasket (22) of the cover (2) for damage.
7. Close the cover (2) of the belt misalignment switch.
8. Secure the cover (2) with the screws (5) (see figure 5-12, page 23).
Tighten the screws (5) **evenly** to a **tightening torque of 1.5 Nm**.
9. Put the belt misalignment switch into operation (see section 5.2.4: „Commissioning“, page 23).

5.2.4 Commissioning

1. Before putting the belt misalignment switch into operation, ensure that it is sealed (see fig. 5-12):
 - Ensure that the screws (5) on the cover (2) are tightened with a **tightening torque of 1.5 Nm**.
 - Check that the screwed cable gland (6) is tightened with a **tightening torque of 6.7 Nm**.

- Check that the dummy plug (25) is fastened tightly.
2. Check the entire belt misalignment switch and its components for damage.



Danger!

Always replace damaged belt misalignment switches.

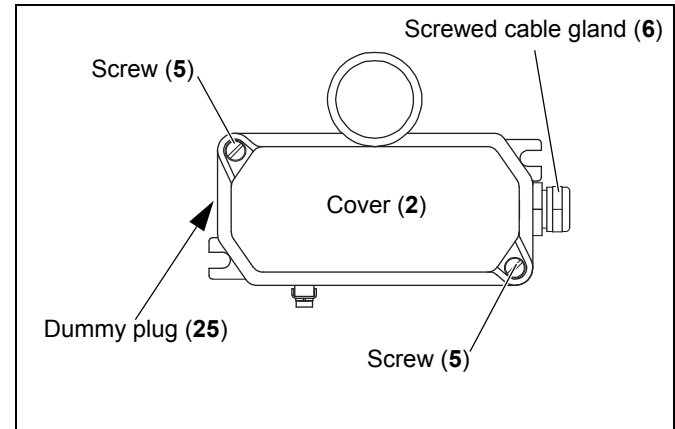


Fig. 5-12: Commissioning the belt misalignment switch

5.3 Dismounting



Danger of fatal electric shock

Work on the device may be performed only by a qualified electrical technician.

Prior to working, switch off the power supply to the system. Ensure that the system cannot be accidentally switched on. Mask any neighboring components that may be live to prevent contact.



Danger!

Open the belt misalignment switch only after it is de-energized.

1. Prior to working, switch off the power supply to the system. Ensure that the conveyor system cannot be accidentally switched on. Mask any neighboring components that may be live to prevent contact.
2. Open the cover (2) by loosening the two screws (5) (see figure 5-12, page 23).
3. Release the screwed cable gland (6) (see fig. 5-13).
4. Disconnect all electrical connections and pull the cables out of the screwed cable gland (6).
5. Loosen both screws that fasten the belt misalignment switch through the long holes to the conveyor system (see figure 5-3, page 17) and remove the belt misalignment switch.

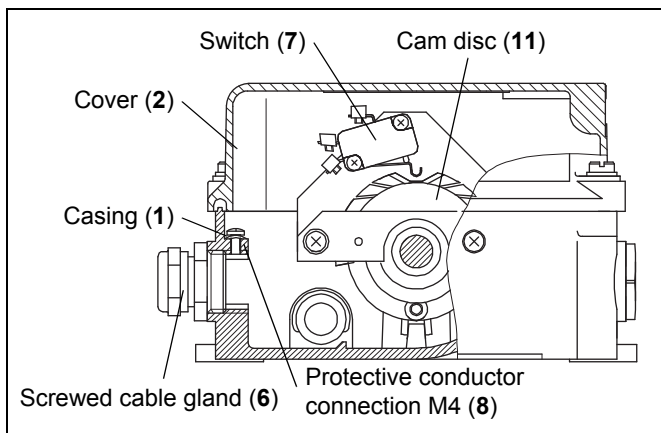


Fig. 5-13: Removing the belt misalignment switch from the conveyor

6 Maintenance

Check the belt misalignment switch at regular intervals (approximately every three months) for proper status and trouble-free functionality.

 **Danger!**

Damaged belt misalignment switches or damaged components (e.g. bolted connections, gaskets) must not to be used.

Always replace damaged belt misalignment switches.

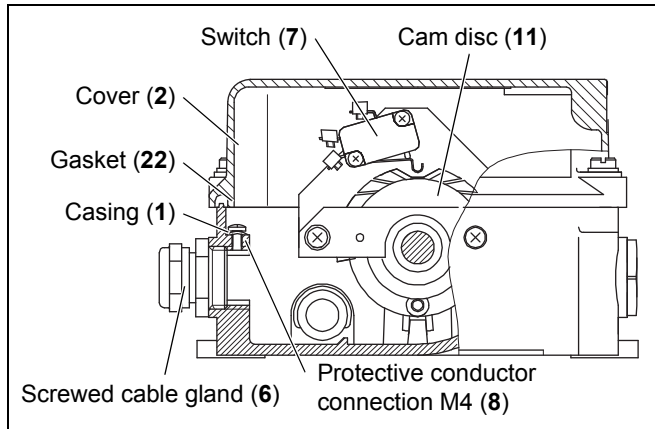


Fig. 6-1: Checking the belt misalignment switch

7 Repairs

7.1 Replacing the roller lever



Danger of fatal electric shock

Work on the device may be performed only by a qualified electrical technician.

Prior to working, switch off the power supply to the system. Ensure that the system cannot be accidentally switched on. Mask any neighboring components that may be live to prevent contact.

1. Prior to working, switch off the power supply to the system. Ensure that the conveyor system cannot be accidentally switched on. Mask any neighboring components that may be live to prevent contact.
2. Loosen the nuts (9) using a 16 mm open-end wrench and remove the roller lever (3) from the shaft (14) (see fig. 7-1).

In order to minimize wear of the roller lever (3), mount the roller lever (3) in such a way that it is located approximately 10 to 20 mm in front of the belt edge (see figure 5-2, page 16).

3. Fit the new roller lever (3) onto the shaft (14).



Beware!

When tightening the nut (9), make sure the distance to the cover (2) is sufficient enough so that the roller lever (3) will not come into contact with the cover (2) when the roller lever (3) is moving.

4. Set the roller lever (3) to the required position and tighten the self-locking nut (9) using an 16 mm open-end wrench.

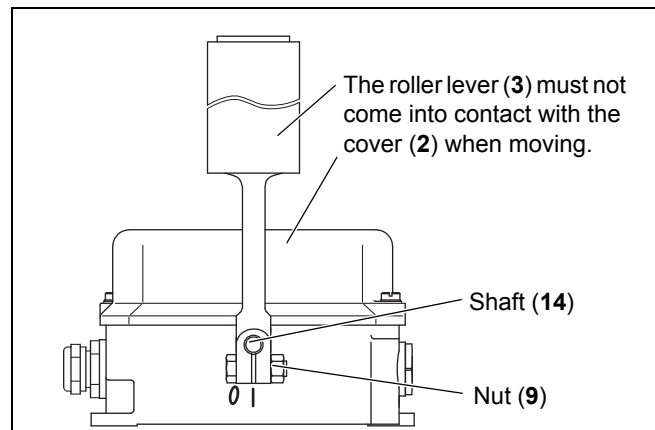


Fig. 7-1: Replacing the roller lever

8 Ordering devices, replacement parts and accessories

8.1 Ordering devices

Please provide the following data with every order (see *legal notice for company address*):

1. **Belt misalignment switch model**
(see *rating plate on casing*): e.g. HES 011
2. **Product number** (see *rating plate on casing cover*):
e.g. 92.057020.011.

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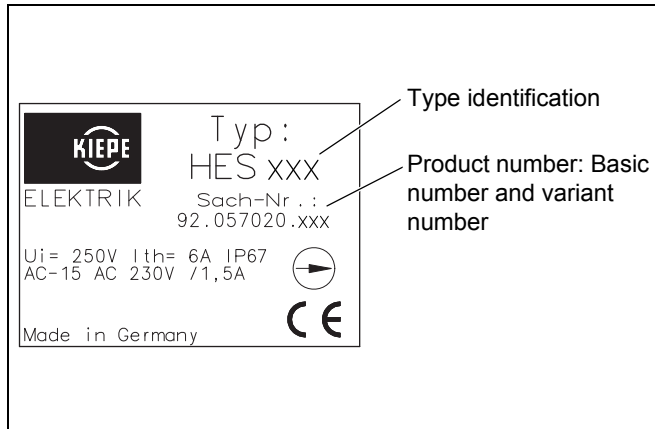


Fig. 8-1: HES printed impression

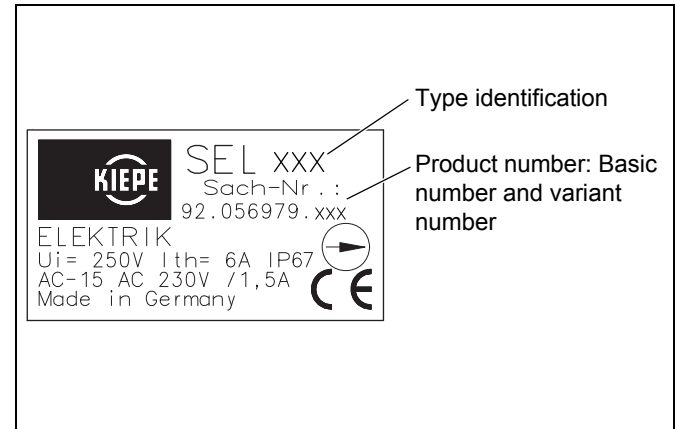


Fig. 8-2: SEL printed impression

8.2 Ordering replacement parts and accessories

Please provide the following data with every order (see *legal notice for company address*):

1. **Belt misalignment switch model**
(see *rating plate on casing*): e.g. HES 011
2. **Product number** (see *rating plate on casing cover*):
e.g. 92.057020.011.
3. **Order information and order number** (see *table*):

| Item | Order information | Order number |
|------|--|-----------------|
| 3 | Control lever with roller (roller lever) | 93.058650.001 |
| 6 | Screwed cable gland | 113.52.02.20.01 |
| 25 | Closure screw (dummy plug) | 113.52.87.20.02 |

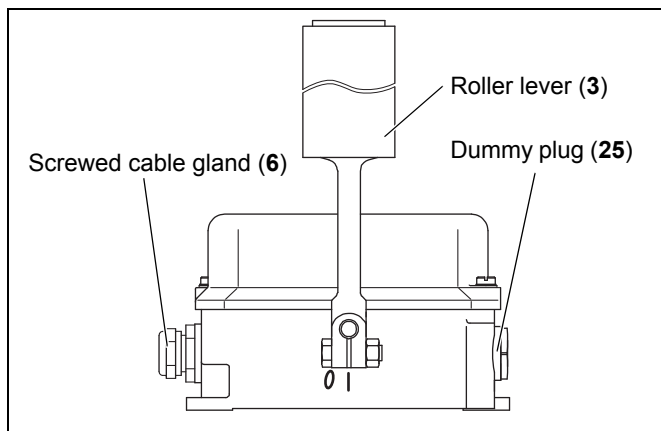


Fig. 8-3: Replacement parts

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