

Operating Instructions No. 2124 (EN)

Device: Add-On Earthing Switch
Type: E
Rated Voltage: 72.5 kV - 550 kV
**Installation and Adjustment of Mechanical Interlock
Between Disconnecter & Add-On Earthing Switch**

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Note: Read the operating instructions carefully before installation and commissioning.

Table of Contents

1	Description
1.1	General
1.2	Bolted Joints
2	General
3	Center-Break Disconnecter, 72.5 - 170 kV
3.1	Add-On Earthing Switch E1
3.2	Add-On Earthing Switch E2
4	Center-Break Disconnecter, 245 - 550 kV
4.1	Base Frame U140
4.2	Base Frame U180
5	Vertical-Break Disconnecter, 245 - 550 kV
6	Pantograph Disconnecter, 245 - 550 kV

Figures

Fig. 1	Center-break disconnecter, 72.5 – 170 kV, with add-on earthing switch E1
Fig. 2	Center-break disconnecter, 72.5 – 170 kV, with add-on earthing switch E2
Fig. 3	Center-break disconnecter, 245 – 550 kV, base frame U140
Fig. 4	Center-break disconnecter, 245 – 550 kV, base frame U180
Fig. 5	Vertical-break disconnecter
Fig. 6	Pantograph disconnecter

1 Description

1.1 General

- Only personnel familiar with the contents of this operating manual shall carry out assembly and installation.

The present operating instructions cover only the installation and adjustment of the mechanical interlock between the disconnecter and the earthing switch. Installation and adjustment of disconnectors and add-on earthing switches is described in the respective operating instructions for those devices.

- These operating instructions shall only be used in conjunction with the operating instructions for the disconnectors and add-on earthing switches.

Please consult the order documentation to determine whether the add-on earthing switch supplied is type E1 or E2.

1.2 Bolted Joints

Lubricate bolted joints **before assembly** using the lubricant **Molykote BR 2 plus**. **Tighten all bolted joints using a torque wrench**. The required tightening torques are given in the following table.

Thread	Tightening Torque in Nm Strength Class		
	8.8	A2-70	A2-80
M6	10	10	14
M8	25	25	33
M10	49	49	65
M12	86	83	110
M14 x 1,5		140	
M16	210	202	270
M20	410	394	525
M24	710	377	

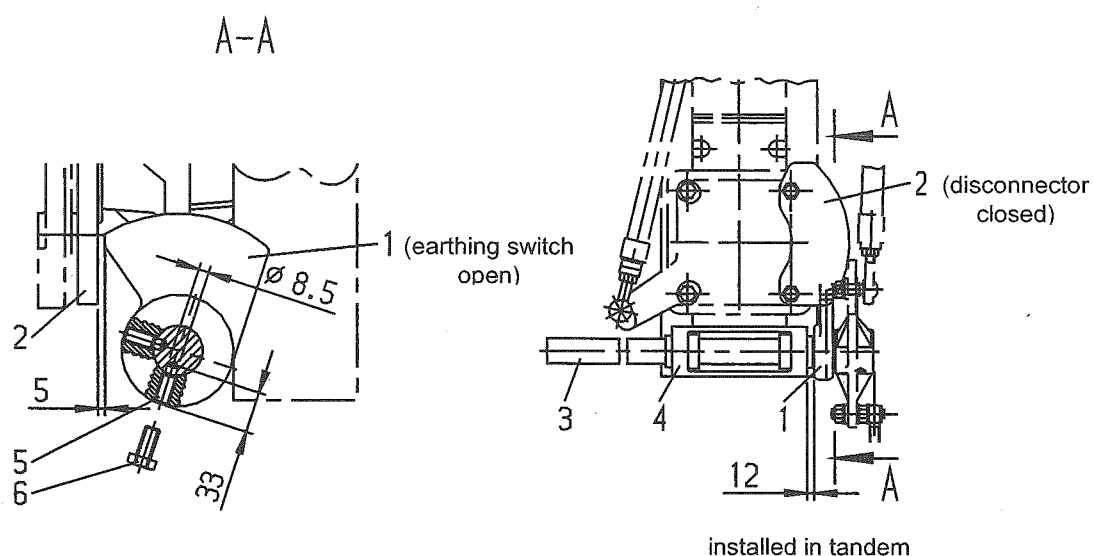
2 General

Install and adjust the mechanical interlock after adjusting the disconnecter and the add-on earthing switch at the conclusion of commissioning. The retaining screw required for installation is included with the parts supplied.

3 Center-Break Disconnecter, 72.5 - 170 kV

3.1 Add-On Earthing Switch E1 (Figure 1)

Open the center-break disconnector and the add-on earthing switch. Fasten locking segment E1 (1) to the earthing switch shaft (3) so that it is 12 mm from the earthing switch bearing (4) and 5 mm from the locking disk E1 (2), as shown in Figure 1. Secure the locking segment using a setscrew with full dog point (5). Screw in the retaining screw (6), drill a hole through locking segment E1 into the earthing switch shaft using an 8.5 mm diameter drill bit, as shown in Figure 1, and secure the locking segment using two setscrews with full dog point.

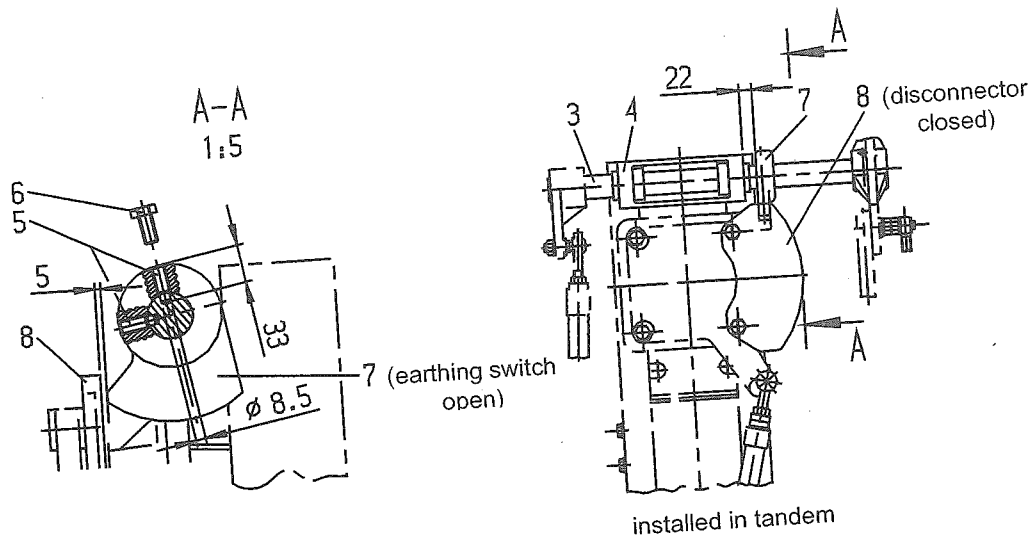


- | | | | |
|---|-----------------------|---|------------------------------|
| 1 | locking segment E1 | 4 | earthing switch bearing |
| 2 | locking disk E1 | 5 | setscrew with full dog point |
| 3 | earthing switch shaft | 6 | retaining screw |

Figure 1: Center-break disconnector, 72.5 – 170 kV, with add-on earthing switch E1

3.2 Add-On Earthing Switch E2 (Figure 2)

Open the center-break disconnect and the add-on earthing switch. Fasten locking segment E2 (7) to the earthing switch shaft (3) so that it is 22 mm from the earthing switch bearing (4) and 5 mm from locking disk E2 (8), as shown in Figure 2. Secure the locking segment using a setscrew with full dog point (5). Screw in the retaining screw (6), drill a hole through the locking segment E2 into the earthing switch shaft using a 8.5 mm diameter drill bit, as shown in Figure 2, and secure the locking segment using two setscrews with full dog point.



- | | | | |
|---|------------------------------|---|--------------------|
| 1 | earthing switch shaft | 6 | retaining screw |
| 4 | earthing switch bearing | 7 | locking segment E2 |
| 5 | setscrew with full dog point | 8 | locking disk E2 |

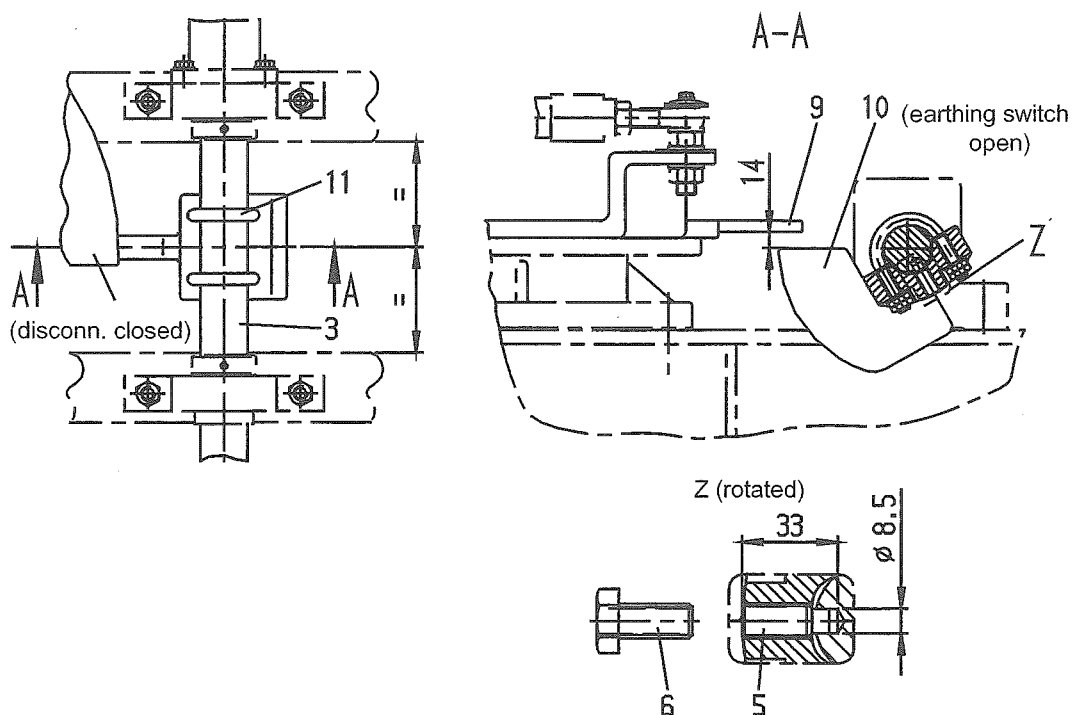
Figure 2: Center-break disconnect, 72.5 – 170 kV, with add-on earthing switch E2

4 Center-Break Disconnecter, 245 - 550 kV

With this type of center-break disconnector, the height of the U section that is part of the base frame is critical for installation of the interlocking mechanism.

4.1 Base Frame U140 (Figure 3)

Open the center-break disconnector and the add-on earthing switch. Fasten the locking segment (10) to the center of the earthing switch shaft (3) using a round steel U-bolt, washers and nuts (11). Adjust the distance between the rotary bearing (9) and the locking segment to equal 14 mm. Screw in the retaining screw (6), drill a hole in the earthing switch shaft using an 8.5 mm diameter drill bit, as shown in Figure 3, and secure the locking segment using two setscrews with full dog point (5) (see Detail Z).

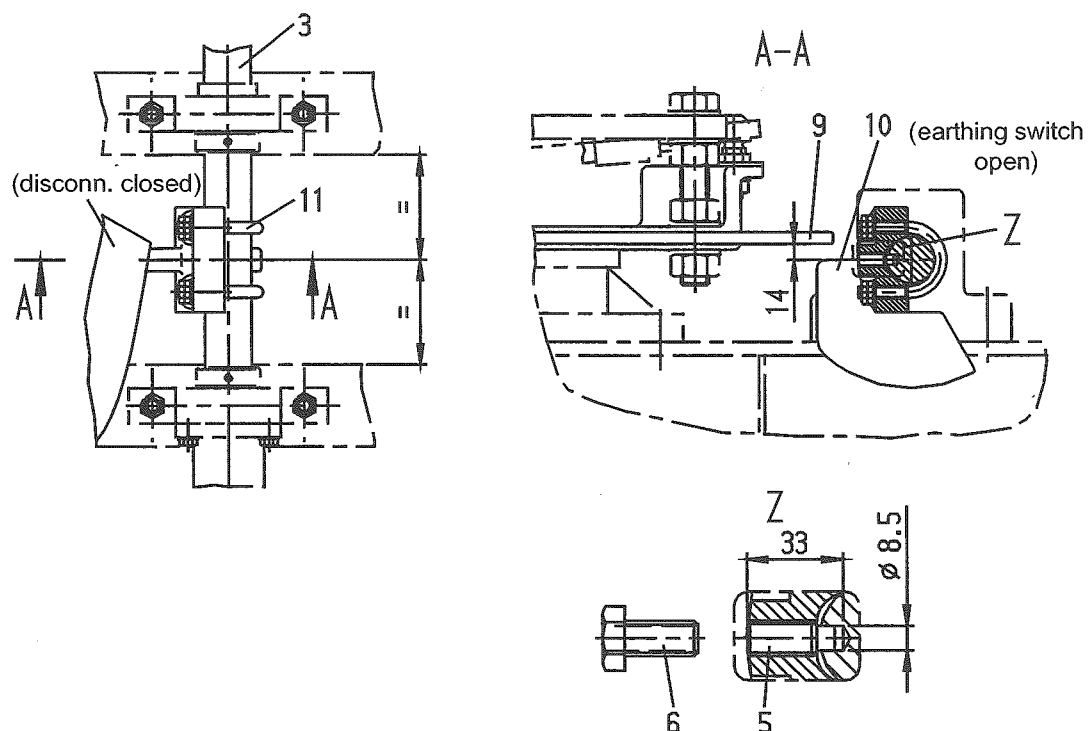


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|---|------------------------------|----|-----------------------------------|
| 3 | earthing switch shaft | 9 | rotary bearing |
| 5 | setscrew with full dog point | 10 | locking segment |
| 6 | retaining screw | 11 | round steel U-bolt, washers, nuts |

Figure 3: Center-break disconnector, 245 – 550 kV, base frame U140 (E1 shown)

4.2 Base Frame U180 (Figure 4)

Open the center-break disconnecter and the add-on earthing switch. Fasten the locking segment (10) to the center of the earthing switch shaft (3) using the round steel U-bolt, washers and nuts (11). Adjust the distance between the rotary bearing (9) and the locking segment to equal 14 mm. Screw in the retaining screw (6), drill a hole in the earthing switch shaft using an 8.5 mm diameter drill bit as shown in Figure 4, and secure the locking segment using two setscrews with full dog point (5) (see Detail Z).



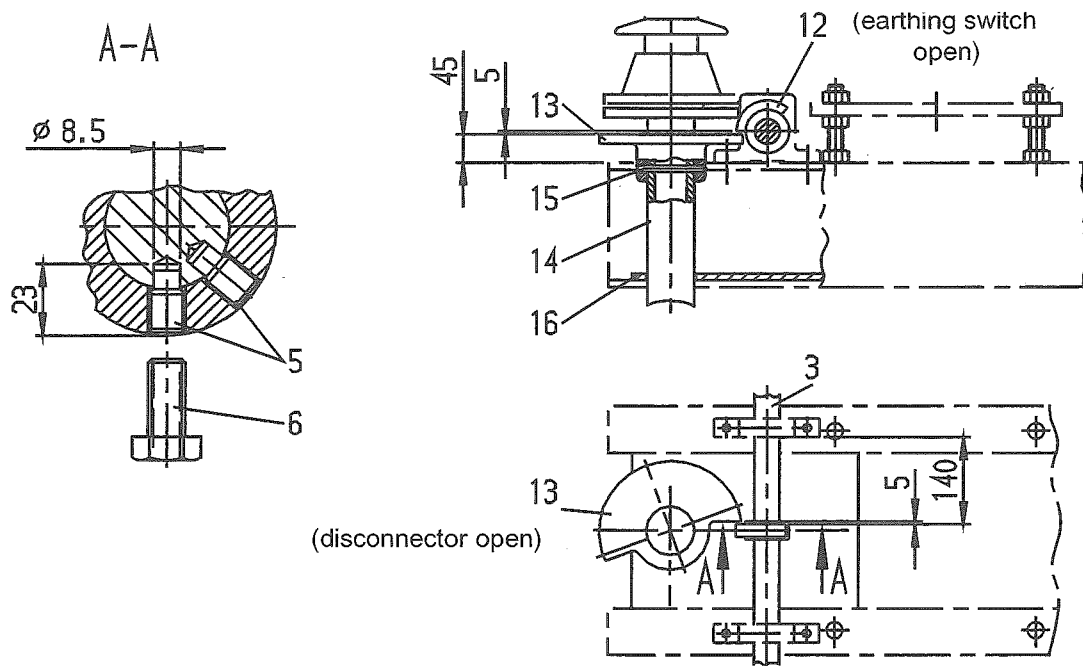
- | | | | |
|---|------------------------------|----|-----------------------------------|
| 3 | earthing switch shaft | 9 | rotary bearing |
| 5 | setscrew with full dog point | 10 | locking segment |
| 6 | retaining screw | 11 | round steel U-bolt, washers, nuts |

Figure 4: Center-break disconnecter, 245 – 550 kV, base frame U180 (E2 shown)

5 Vertical-Break Disconnecter, 245 - 550 kV (Figure 5)

A mechanical interlock is only possible in conjunction with add-on earthing switch E1 (mounting on bearing frame).

Open the vertical-break disconnector and the add-on earthing switch. Using a setscrew with full dog point (5), fasten locking disk H (12) to the earthing switch shaft (3), as shown in Figure 5, so that it is 140 mm from the earthing switch bearing on the right (**do not drill yet**). Attach the locking segment (13) to the connecting tube (14), as shown in Figure 5. Adjust it so that it is 45 mm from the upper edge of the base frame (in the side view) and 5 mm from the locking disk (in the top view). Drill a hole through the locking segment and the connecting tube using a 10 mm diameter drill bit, and fasten using the 10x120 roll pin (15) supplied. Screw in the retaining screw (6), drill a hole through locking disk H into the earthing switch shaft using an 8.5 mm drill bit, as shown in Figure 5 (maintaining the 5 mm dimension in the side view), and secure locking disk H using two setscrews with full dog point (5) (Section A-A). Align the guide plate (16) in the base frame so that the connecting tube is in the center of the hole in the guide plate.

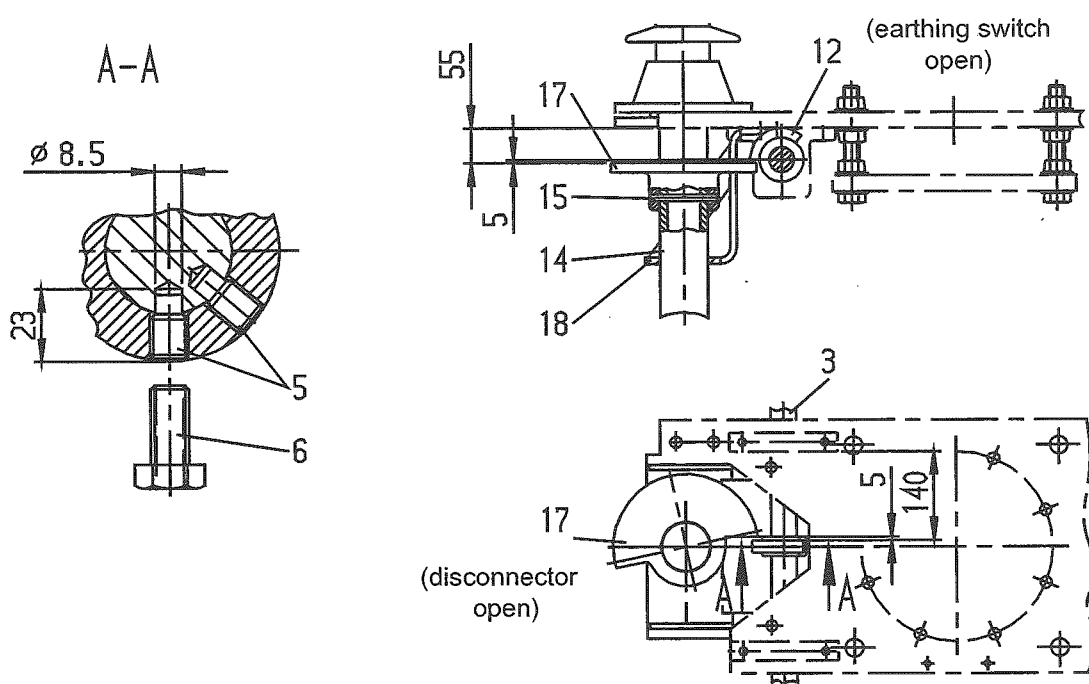


3	earthing switch shaft	13	locking segment
5	setscrew with full dog point	14	connecting tube
6	retaining screw	15	roll pin 10 x 120
12	locking disk H	16	guide plate

Figure 5: Vertical-break disconnector (add-on earthing switch, bearing frame)

6 Pantograph Disconnecter, 245 - 550 kV (Figure 6)

Open the pantograph disconnector and the add-on earthing switch. Using a setscrew with a full dog point (5), fasten locking disk P (12) to the earthing switch shaft (3), as shown in Figure 6, so that it is 140 mm from the earthing switch bearing on the right (**do not drill yet**). Attach the locking segment (17) to the connecting tube (14), as shown in Figure 6. Maintain a distance of 55 mm from the lower edge of the base plate (in the side view) and 5 mm from the locking disk (in the top view). Drill a hole through the locking segment into the connecting tube using a 10 mm diameter drill, and fasten using the 10x120 roll pin (15) supplied with the device. Screw in the retaining screw (6), drill a hole through locking disk P into the earthing switch shaft using an 8.5 mm diameter drill bit, as shown in Figure 6 (maintaining the 5 mm dimension in the side view), and secure locking disk P using two setscrews with full dog point (5) (Section A-A). Align the guide (18) in the base plate so that the connecting tube is in the center of the hole in the guide plate.



3	earthing switch shaft	14	connecting tube
5	setscrew with full dog point	15	roll pin 10 x 120
6	retaining screw	17	locking segment
12	locking disk P	18	guide

Figure 6: Pantograph disconnector

In the event of questions, orders for replacement parts, or malfunctions, please contact your nearest AREVA representative, providing all the information shown on the nameplate.