Instructions for use

Portable earthing and short circuiting devices in accordance with DIN VDE 0683 Part 1

GA66GB-03.18

We would ask you to completely read this instruction for use before use of earthing and short-circuiting devices, namely the safety hints!
Keep this instruction for use available for information when required.

In case you will hand over the earthing and short-circuiting device to another person, include the instruction for use!

Due to the multitude of variations, your earthing and short-circuiting device may vary from the following pictures.

1. Earthing and short circuiting devices

1.1 General information

Earthing and short circuiting (E&S/C) devices are used to earth and short circuit de-energised parts of electrical installations that have been tested for absence of voltage.

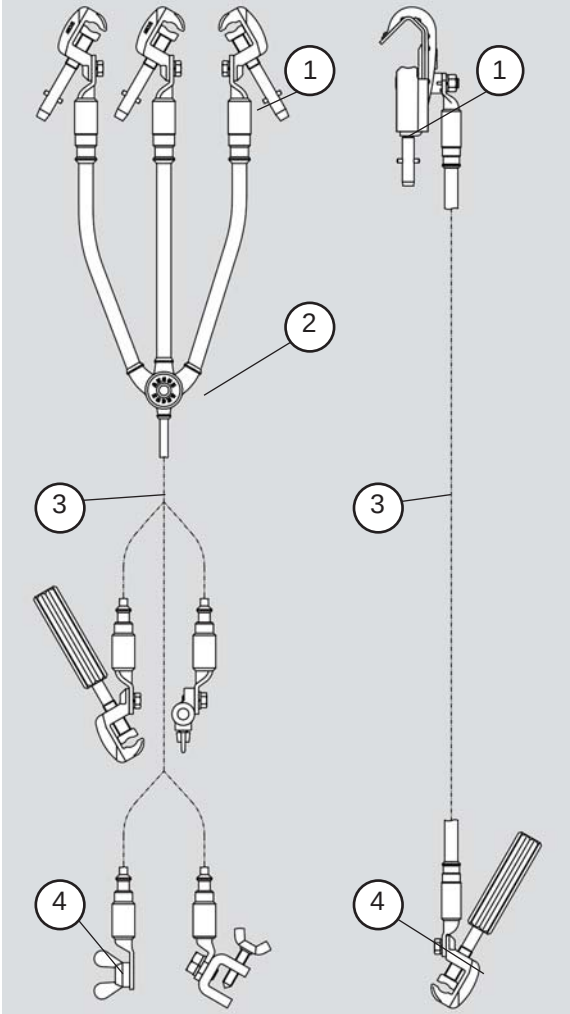
1.2 Safety information

- In order to avoid risks, both EN 50110 and local accident prevention regulations must be observed when using E&S/C devices!
- E&S/C devices may only be used within the framework of the 5 safety rules!
- E&S/C devices may only be used on de-energised parts of electrical installations that have been tested for absence of voltage!
- E&S/C devices may not be used to transmit current!
- De-energised parts of systems may still carry considerable residual voltage. Phase connecting parts (1) may therefore only be directed and attached to the phase conductor using earthing rods or other suitable insulating means.
- E&S/C devices and their fixed points may not be re-used if they have already been subjected to a short circuit current!

1.3 Storage, maintenance and inspection

The purpose of E&S/C devices is to provide protection and safety; they must therefore be treated with care.
E&S/C devices must be stored in dry and clean premises.
Examine the E&S/C devices regularly to make sure they are in faultless condition. The frequency and nature of these inspections depends on the specific conditions of application and storage.
A guideline for such inspections can also be found in Section 1.4 "*Prior to each use*".
We recommend conducting these inspections at annual intervals until you have gained sufficient knowledge to permit an extension of the intervals.
If you decide to replace individual components, e.g. connecting parts (1,4), we recommend that you contact us.

Fig. 1.1



3-phase **1-phase**

Earthing and short circuiting device

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1.4 Prior to each use

Before using the E&S/C devices, examine them each time to make sure they are in faultless condition. Particular attention should be paid to the following:

Visual inspection: Check

- that the device is complete
- the connecting parts (fig. 1.1 / pos. 1,4) for any damages
- that the contact surfaces of the connecting parts (fig. 1.1 / pos. 1,4)) are clean
- the short circuiting (fig. 1.1 / pos. 2) and earthing (fig. 1.1 / pos. 3) leads for corrosion or broken wires
- the lead insulation for cracks or discolouration caused by overheating
- the labels, especially the cross section details

Manual examination: Check

- to make sure all moving parts are smooth running
- to make sure all detachable connections are firmly tightened

Caution: If you detect any faults during one or more of these checks, take the device out of circulation.

1.5 Assembly

Our E&S/C devices are delivered ready for use. There is no need for on-site assembly.

1.6 Intended usage

- E&S/C devices must always be connected to the earthing system first. When removing the devices, they must be disconnected from the earthing system as the last step.
- E&S/C devices may only be used in electrical installations with the short circuit currents and times for which they have been designed.
- Connecting parts and points may only be joined to conductors with the shape and dimensions for which they have been designed. The same applies when joining connecting parts to connecting points.
- The full short circuit strength of the E&S/C device is only assured if the contact surfaces between the connecting parts and the connecting points are metallic blank and the connecting parts have been screwed hand-tight (using both hands if an earthing rod is used).
- The length of the leads of E&S/C devices between two connecting points may not be less than 1.2 times the distance between the connecting points.
- The leads should not, however, be too long as they will bang if a short circuit occurs.
- In the case of using E&S/C devices for parallel earthing, each lead may only be exposed to 75% of the load for which the full cross section is designed.
- Furthermore, the length and cross section of the leads, the connecting parts and the connecting points must be the same for all the E&S/C devices. The devices must be installed in close consecutive sequence, make sure the leads are parallel.

1.7 Rated values

Our E&S/C devices are suitable for temperatures ranging between -25°C and +55°C. The short circuit strength of our E&S/C devices is determined by the short circuit strength of the leads that are used. Based on the cross section information on the short circuit cables, the maximum permissible short circuit current for the E&S/C device can be derived from the following table.

The values in the table apply to:

- Single and three phase alternating current systems
- A max. cable end temperature of 250°C in the event of a short circuit (for copper leads)
- And a short circuit that occurs far from the generator.

If current and time values are explicitly indicated on the E&S/C device (e.g. on an additional label), these values are applicable.

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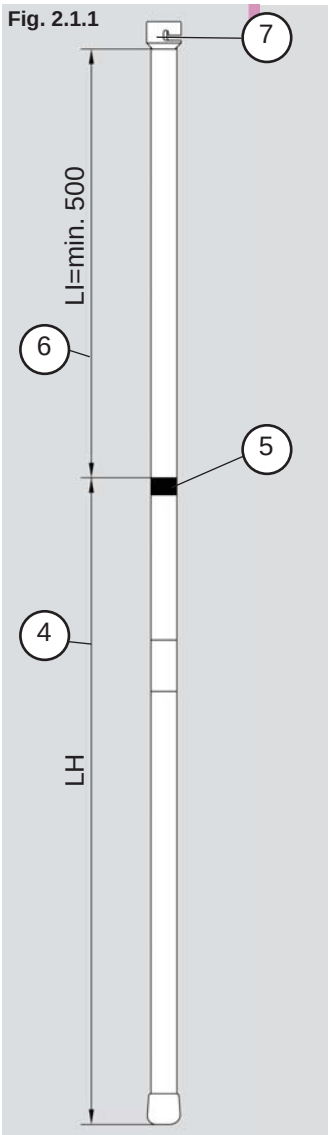
Table – *Rated currents in [kA] for copper leads (Cu) and aluminium leads (Al), depending on the duration of current flow*

Cross section[mm²] / Material	Highest admissible short circuit current in kA at a duration of				
	10 s	5 s	2 s	1 s	≤ 0.5 s
16 / Cu	1.0	1.4	2.2	3.2	4.5
25 / Cu	1.6	2.2	3.5	4.9	7.0
35 / Cu	2.2	3.1	4.9	6.9	10.0
50 / Cu	3.1	4.4	7.0	9.9	14.0
70 / Al	3.1	4.4	7.0	9.9	14.0
70 / Cu	4.4	6.2	9.8	13.8	19.5
95 / Cu	5.9	8.4	13.2	18.7	26.5
120 / Cu	7.5	10.6	16.7	23.7	33.5
150 / Cu	9.4	13.2	20.9	29.6	42.0

Fig. 2.1.1



Single-section earthing rod

2. Earthing rods

2.1 General information

Earthing rods are insulating rods for joining the connecting parts of earthing and short circuiting devices to de-energised parts of electrical installations that have been tested for absence of voltage; their purpose is to earth and short circuit in accordance with EN 50110.
Earthing rods consist of a handle LH (4), a black ring (5), the insulation section LI (6), and a coupling (7) for connecting the phase connection clamp. The handle LH (4) is the part of the earthing rod that may be held during use. The insulating section LI (6) is at least 500 mm long. It keeps the user at the necessary safe distance and provides sufficient insulation for safe usage. Earthing rods for low-voltage use may have a different design.

2.2 Storage, maintenance and inspection

Earthing rods must be treated with care. They should be stored in dry and clean premises.
Earthing rods must be examined regularly to ensure they are in faultless condition. The frequency and nature of these checks depends on the specific conditions of application and storage.
As far as their insulating properties are concerned, earthing rods can be kept virtually as good as new by lightly greasing them with ARCUS silicone grease (order no. 625 004) approximately once a year.

2.3 Prior to each use

Check the earthing rod before each use to make sure it is in impeccable condition. Particular attention should be paid to the following:

Visual inspection: Check

- that the earthing rod is complete
- the coupling and connecting parts for damages
- the insulating tube for fractures, cracks and other severe damages
- the presence of the black ring or hand protection disc
- the labels, particularly the instructions for use

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Manual examination:
- Check that the coupling and connecting parts are working properly

Attention: If you detect any faults during one or more of these checks, take the earthing rod out of circulation.

2.4 Assembly
Our earthing rods are delivered ready for use.
On-site assembly is only necessary for multi-section, pluggable rods. In this case, the labels on the individual rod sections and the information in the instructions for the use of the earthing rods must be observed.

2.5 Intended usage
- Earthing rods must not be used to verify the absence of voltage!
- When short circuiting, only the handle LH (fig. 2.1.1 / pos. 4) of the earthing rod may be touched!
- The insulating section LI (fig. 2.1.1 / pos. 6) on the earthing rod provides sufficient protection against residual voltage if users guide the rod in such a way that the insulating section LI (fig. 2.1.1 / pos. 6) is between the user's body and any part of the installation that is still carrying residual voltage; this ensures the necessary safety clearance.
- An adhesive label marked "Earthing rod" is affixed to each rod. Rods with couplings (fig. 2.1.1 / pos. 7) for joining various connectors also indicate a figure in kg, which is the maximum weight of an E&S/C device that can be safely lifted and directed with the earthing rod (see fig. 2.5.1).
- Prior to connection with the conductor, the spindle of the connecting part must be locked into the coupling (fig. 2.1.1 / pos. 7) on the earthing rod and, if necessary, secured against unintentional disconnection (see fig. 2.5.2).
  Verify again that all connecting parts are locked in securely or otherwise fixed immediately prior to use!

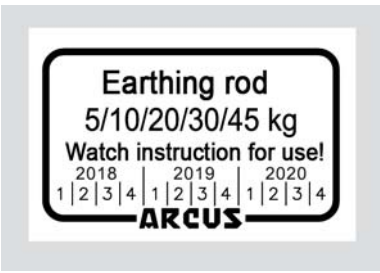

Fig. 2.5.1

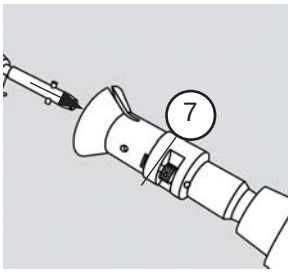

Fig. 2.5.2

3. Disposal
Disposal of the E&S/C device and/or earthing rod must comply with local regulations. ARCUS Schiffmann accepts no liability for incorrect disposal.
Please do not hesitate to contact ARCUS Schiffmann if you require clarification about any of the materials used.

4. Product liability and warranty
These instructions for use have been prepared with the greatest possible care and were reviewed prior to publication.
Warranty liability will only be accepted upon proof of compliance with the instructions for use in terms of storage, assembly, operation, maintenance and care.

Attention: Please note that your own modifications on the product will cause safety risks and expiry of product liability.

The General Terms and Conditions of Sale and Delivery for Electrical Products and Services apply.

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