

You will find the operating manual
on: www.a-eberle.de



Installation Manual

Earth fault and short circuit indicator

Modell: EOR-1DS

- ▶ General Information
- ▶ Safety details
- ▶ Installation
- ▶ Operation / Display
- ▶ Technical specifications



A. Eberle GmbH & Co. KG

Frankenstraße 160
D-90461 Nürnberg

Telephone: 0911 / 62 81 08 0

Telefax: 0911 / 62 81 08 99

E-Mail: info@a-eberle.de

Internet: www.a-eberle.de

1. General Information

1.1 General Information

This installation manual contains all important information regarding mounting and commissioning. Read this manual carefully and completely as it contains important information about the product. Use this information and obey the security details and warnings. Store this manual securely and make sure that it is always available to the product operator.

The company **A. Eberle GmbH & Co. KG** does not accept any liability for damage or losses of any kind arising from noncompliance with this information as well as printing errors or changes in this manual. Furthermore, the company **A. Eberle GmbH & Co. KG** will not accept any liability for loss or damage of any kind resulting from faulty equipment or devices that have been modified by the user.

1.2 Changes

Please notice that these installation instructions may not always contain the latest information concerning the device. If, for example, the firmware version has changed, then the present description may be incorrect in some points.

In this case please contact us or use the current version of this document and any additional documents concerning this device on our website (<https://www.a-eberle.de/en/>).

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Changes reserved

1.3 Disposal

Directive 2012/19/EU, better known as the WEEE2 directive, deals with the return and recycling of electronic waste and electrical equipment in order to recover valuable raw materials. This concerns all A. Eberle products marked with the symbol of a waste garbage can.



➡ Our WEEE registration number is:

DE 37396879



For old devices please also note the information on our homepage:

<https://www.a-eberle.de/en/about-us/take-back-recycling/>

1.4 Warranty

We guarantee that every product of A. Eberle GmbH & Co. KG is free of material and manufacturing defects under normal use. The detailed conditions for the warranty can be found in our general terms and conditions of business under: <https://www.a-eberle.de/en/general-terms/>.

To claim warranty, please contact A. Eberle GmbH & Co. KG in Nuremberg or use the RMA formular on our homepage under <https://www.a-eberle.de/en/>.

2. Safety details

2.1 Safety instructions


IT IS IMPORTANT TO OBEY THESE INSTRUCTIONS IN ORDER TO ENSURE THE SAFETY OF INDIVIDUALS. THESE INSTRUCTIONS ARE TO BE STORED SECURELY!

- Observe the operating instructions.
- Always keep the operating instructions with the unit.
- Make sure that the device is never operated in a damaged or compromised condition.
- Make sure that only specialized personnel operate the unit.
- The device must be connected according to the manufacturer's installation instructions.
- Make sure that the device is never operated beyond its stated ratings.
- Do not install or operate the device in environments where explosive gases, dust or vapors may be present.
- Ensure that protective covers are always in place and are functional.
- Ensure that the five safety regulations according to DIN VDE 0105 are always observed.
- Clean the appliance only with commercially available detergents.

These installation instructions do not contain every safety detail necessary for operating the device. Special operating conditions may require additional measures. These installation instructions contain references that have to be obeyed for your personal safety and to prevent property damage.


2.2 Structure of warnings


Warnings are structured as follows:


| | |
|--|--|
|  SIGNAL WORD | <p>Nature and source of the danger.</p> <p>Consequences of non-compliance.</p> <ul style="list-style-type: none"> ➤ Measure to avoid the danger. |
|--|--|

2.3 Types of warnings


Warnings are distinguished by the type of danger they are warning against:

| | |
|--|---|
|  DANGER! | Warns of imminent danger that can result in death or serious injuries if not avoided. |
|--|---|

| | |
|---|---|
|  WARNING! | Warns of a potentially dangerous situation that can result in death or serious injuries when not avoided. |
|---|---|

| | |
|---|--|
|  CAUTION! | Warns of a potentially dangerous situation that can result in fairly serious or minor injuries when not avoided. |
|---|--|

| | |
|----------------|--|
| NOTICE! | Warns of a potentially dangerous situation that if not avoided could result in material or environmental damage. |
|----------------|--|

| | |
|---|--|
|  | Tips on the appropriate device use and recommendations |
|---|--|

2.4 Intended use

The Earth Fault and Short Circuit Indicator EOR-1DS is intended for fixed installation and the continual measurement, monitoring and evaluation of voltages and currents.

The EOR-1DS is exclusively intended for use in electrical power engineering facilities and installations, where professionals carry out the necessary work.

Professionals are defined as people who are familiar with the installation, assembly, commissioning and operation of such products. They have qualifications that meet the requirements of their activities.

The earth fault and short circuit indicator EOR-1DS complies with the laws, rules and standards applicable at the time of delivery, in particular with relevant safety and health requirements.

In order to maintain this condition and ensure safe operation, the operator must follow all the instructions and warnings in the user manual and the technical data must be observed.

A. Eberle GmbH & Co. KG accepts no liability for damage resulting from unauthorized or improper modification or use of the product. Improper modifications of the product without consultation with A. Eberle GmbH & Co. KG can lead to personal injury, property damage and malfunctions.

The EOR-1DS is suitable for the following sites of installation and may only be operated in these locations:

- Switch panel mounting
- DIN rail mounting

2.5 Other applicable documents

For safe and correct use of the facility also notice the additional documents, e. g. the complete operating instructions and included documents as well as effective standards and laws.

2.6 Target group

The installation manual is intended for skilled technicians and trained and certified operators. The contents of this installation manual must be accessible to people tasked with the installation and operation of the system. To avoid personal or property damage the operating personnel must be an electrically trained person with the following knowledge.

- Knowledge of national accident prevention guidelines
- Knowledge of standards in safety engineering
- Knowledge of installation, commissioning and operation

2.7 Cleaning instructions

Use a soft, slightly damp, lint-free cloth. Make sure no liquid gets in the housing. Do not use window cleaners, sprays, dissolvent, cleaners that contain alcohol, ammonia solutions or abrasive cleaning agents.

Only use water for cleaning.

2.8 Meaning of the symbols in use



CAUTION - DANGER! Read the operating instructions and security details



The CE label guarantees the adherence of european directives and the regulations concerning the EMV



The CMIM label guarantees the adherence of safety standards for electronic products in Morocco.



DC Voltage



AC Voltage



DC or AC Voltage



WEEE2 label, see chapter 1.3

3. Commissioning

3.1 EOR-1DS short description

The EOR-1DS combines earth fault and short circuit location in a compact device. The advantages of various locating methods can be used and with four bistable relays and a Modbus RTU connection the EOR-1DS is suited for the use in local substations.

3.2 Scope of delivery

The EOR-1DS's scope of delivery includes a display unit for indication and localization of short circuits and earth faults. Depending on the order characteristics 'C' and 'U' the device is delivered with different measurement cards and / or additional current and voltage adapters. In addition, depending on the order characteristic 'V' the device has a RJ45 port.

- EOR-1DS possibly including C21/25 and / or U10 Adapter (with connection cables towards EOR-1DS device and mounting option 'device frame' or 'DIN rail adapter')
- Installation instructions
- Additionally ordered LRM adapter cables
- Additionally ordered flashing light
- Additionally ordered case adapters for DIN rail mounting

We take care of it.

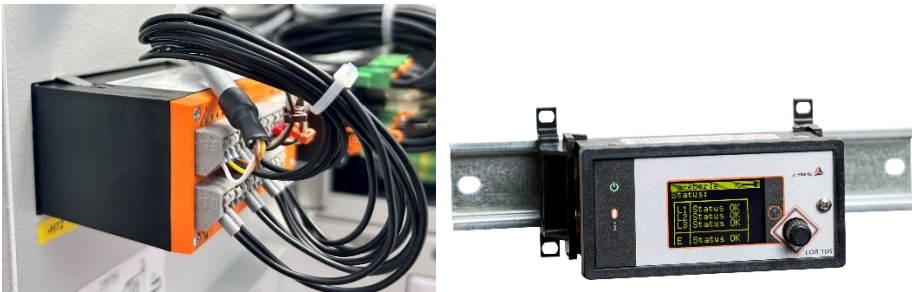
3.3 Mounting

The EOR-1DS is designed for mounting in a compact switch gear. It is mounted in a control panel cut-out or with an additional available housing adapter on a DIN rail. The cut-out needs the following dimensions: 92+0.8 x 45+0.6 mm.

NOTICE! Property damage by failure to comply to the mounting instructions

The device can be damaged by disregarding the mounting instructions or through incorrect mounting!

The EOR-1DS has metal brackets on the top and bottom. When correctly mounted these brackets lock in place in the cut-out.



EOR-1DS in control panel cut-out EOR-1DS mounted on a DIN rail

To mount the DIN rail adapter the four screws on the back of the EOR-1DS have to be removed. Afterwards the rail adapter can be mounted using the same screws.



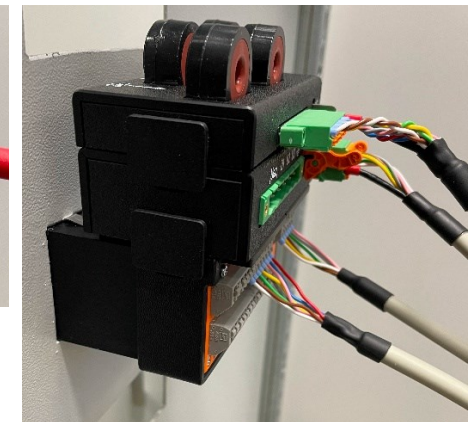
Mounting the DIN rail adapter onto the EOR-1DS

The optional C21 and C25 current adapters and the optional U10 voltage adapter can be mounted on the top of the device with the help of a device frame on top of the EOR-1DS. Therefore the two upper screws on the back of the EOR-1DS have to be removed and the device frame incl. the plug-on adapters be mounted with the two additional provided longer screws.

It is important to first put optionally wired adapters on the EOR-1DS through the panel cut-out and to mount the EOR-1DS in the panel cut-out before the mounting frame is fixed on the EOR-1DS and the adapters are clicked on the mounting frame.



EOR-1DS in panel cut-out without mounting frame, optionally with already wired adapters



EOR-1DS with mounting frame and clicked on adapters

Alternatively, the adapters can be mounted with the help of a DIN rail adapter separately. Therefore connection cables in different lengths (0.3 m / 1.5 m / 3.0 m) can be ordered.



EOR-1DS and DIN rail adapter mounted separately *EOR-1DS and C21/U10 adapter mounted on DIN rail with separate adapters*

3.4 Supply voltage

The EOR-1DS has a wide range power supply that can be used in the range between DC 20...148 V. The power supply is protected against polarity reversal, i.e. a connection with reverse polarity on terminals 15 and 16 in the range of the permitted operating voltage does not damage the device. A detailed connection description (e. g. wire cross section) can be found in chapter 5.20.

⚠ DANGER!

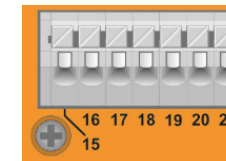
Risk of death through electric shock!

Serious injuries or death can be caused by:

- Touching blank or not insulated live wires.
- Touching hazardous connectors on the device.
- ➡ Assemble / disassemble the device only in voltage free state.
- ➡ Make sure all wires are connected and strain-relieved.
- ➡ The cable requirements of all connector blocks have to be met.

L(+) ———— 15

L(-) ———— 16



Connecting the supply voltage

After connecting and switching on the supply voltage the power LED will show a green light (see chapter 4.1) and the device is ready for operation. The terminal assignment can be found in chapter 5.20.

NOTICE!

Property damage due to disregarding the terminal assignment or improper voltages!!

By disregarding the terminal assignment or exceeding the permitted voltage range the device can be damaged or destroyed. Make sure to follow these instructions before connecting the device to the supply voltage:

- ➡ Voltage and frequencies have to correspond to the identification plate!
Obey limits according to the technical specifications.
- ➡ Do not take the supply voltage from the voltage transducer.

3.5 Variants in connecting the measurement inputs

⚠ WARNING!

Personal or property damage due to disregarding the safety instructions

- ➡ Please read this manual carefully before connecting the terminals and obey the given safety instructions.

The EOR-1DS can be connected to low power sensors and classic (inductive) transducers. The suitable analog input is selected during order process (order characteristics “C” and “U”). For technical data of the different analog inputs please refer to the latest EOR-1DS data sheet.

The EOR-1DS has a maximum of three voltage inputs and four current inputs. Hereby three phase voltages and three phase currents as well as the zero sequence current (3I₀) can be measured.

The following chapter explains the connection of the measuring transformer and low power sensors depending on the chosen features.



Notice the technical specifications when connecting the different “C” and “U” features (chapter 5.20)



Check the respective I/O configuration in the device menu before connecting voltage and current sensors or transducers to the EOR-1DS.

3.5.1 Connecting low power sensors LR/LRM systems

⚠ DANGER!

Risk of death through electric shock

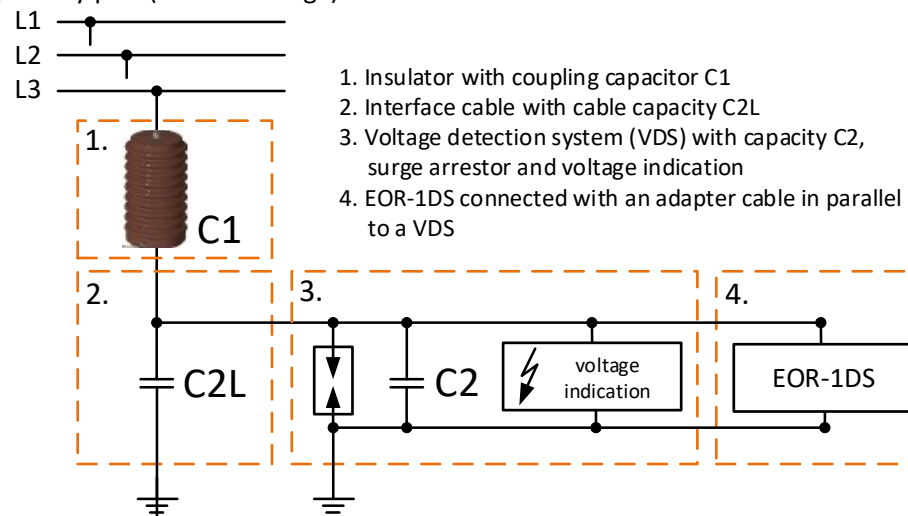
Attention dangerous contact voltage!

- ➡ Check for zero potential before executing this task!
- ➡ Make sure all wires are connected and strain-relieved.
- ➡ The cable requirements of all connector blocks have to be met. (see chapter 5.20)

3.5.1.1 Connection for capacitive LRM systems (incl. adapter cable)

With the EOR-1DS it is possible to measure voltage in parallel to a capacitive voltage detecting system.

primary part (middle voltage)

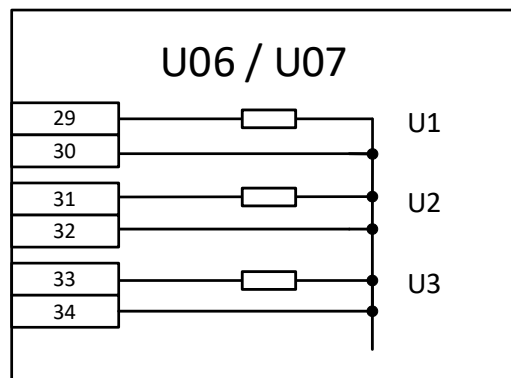


Principle schematic of connecting the EOR-1DS to a capacitive transducer



LRM interface on the back of the EOR-1DS

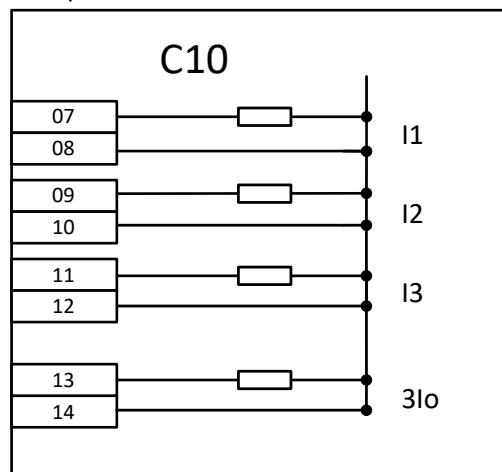
3.5.1.2 U06/U07 connection for low power voltage sensors (burden 200 kΩ or 2 MΩ)



Terminal assignment for characteristics U06/U07

3.5.1.3 C10 connection for low power current sensors

The EOR-1DS offers the possibility to connect low power current sensors from multiple manufacturers.



Terminal assignment for characteristic C10

3.5.2 Connection of transducers

GEFAHR!

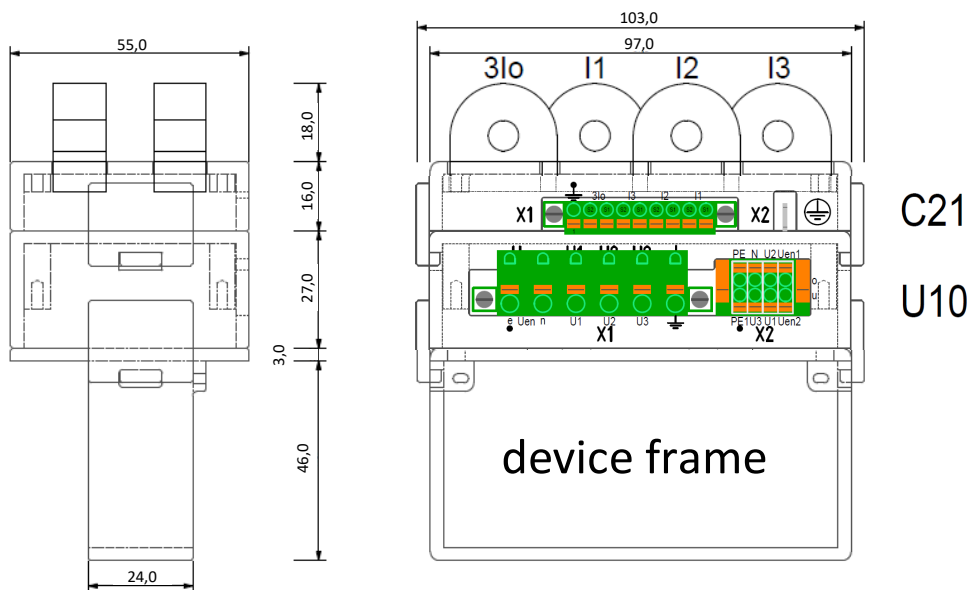
Risk of death through electric shock!

Attention dangerous contact voltage!

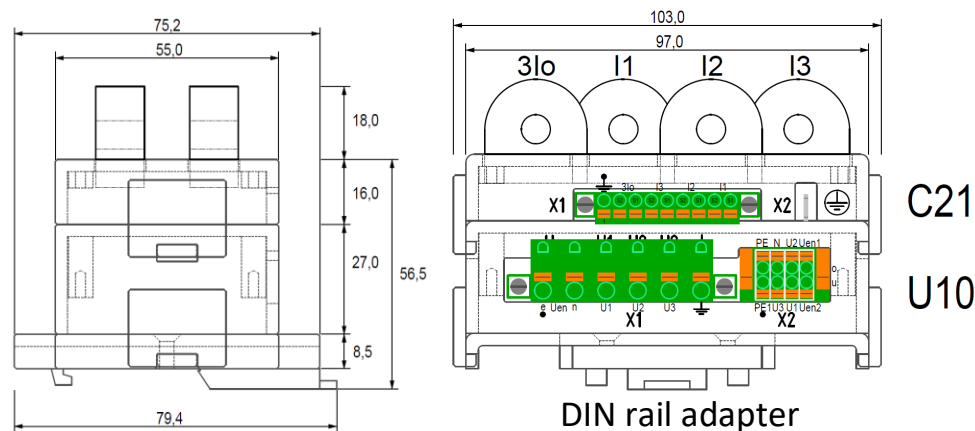
Voltage spark over and high short circuit currents in CAT II and CAT III possible!

- ➔ Check for zero potential before executing this task!
- ➔ Short circuit the current transducer before executing this task.
- ➔ Make sure all wires are connected and strain relieved.
- ➔ The cable requirements of all connector blocks have to be met. (see chapter 5.20)

3.5.2.1 Adapter modules C21/C25 (only 3I₀ measurement) and U10



C21 adapter for current measurement 1A / 5A and U10 adapter for voltage measurement 100 V / 110 V incl. frame for mounting on EOR-1DS device

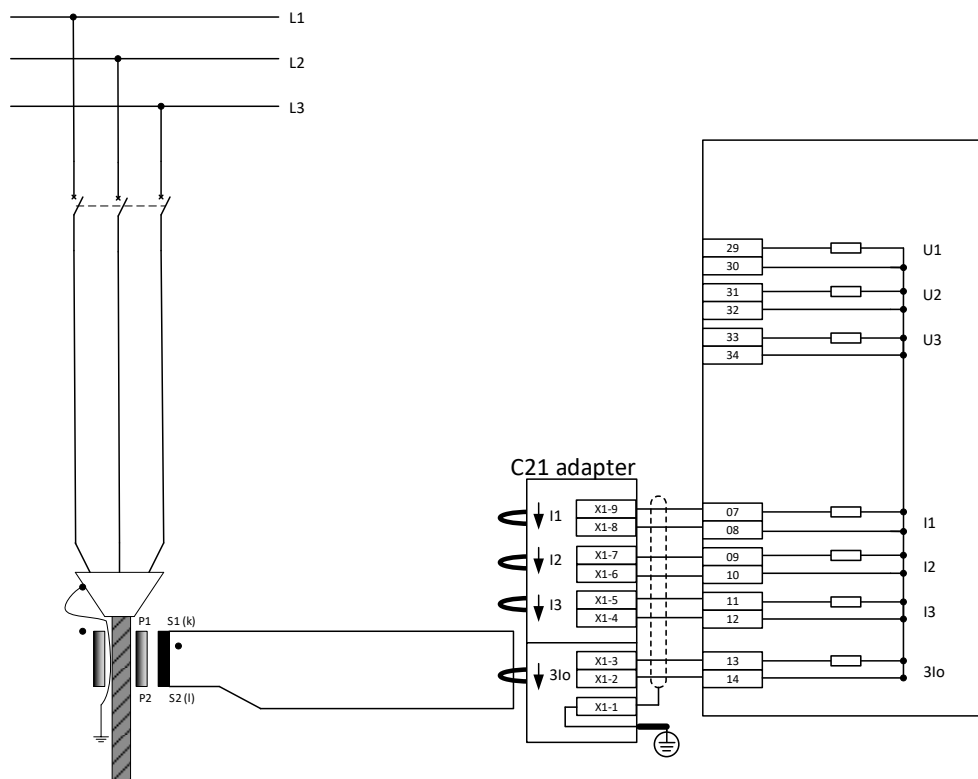


C21 adapter for current measurement 1A / 5A and U10 adapter for voltage measurement 100 V / 110 V incl. DIN rail adapter for separate mounting

A detailed connection description (e. g. wire cross section) can be found in chapter 5.20.

3.5.2.2 Connection zero sequence current $3I_0$

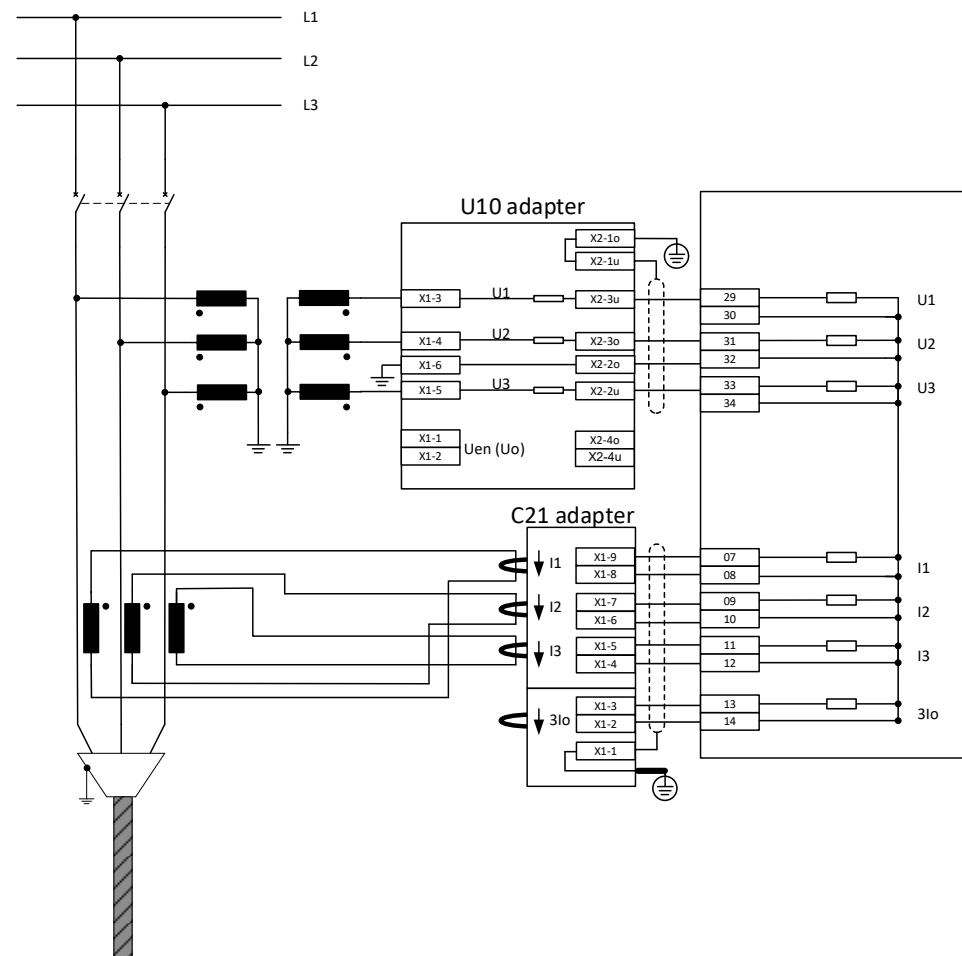
A core-balanced current transformer is used to measure $3I_0$.



Connection of total current ($3I_0$) to the EOR-1DS using C21 or C25 adapters

3.5.2.3 Connection of phase to earth voltages U_{L1} , U_{L2} , U_{L3} and phase currents I_{L1} , I_{L2} , I_{L3}

In the following example, only the phase voltages and the phase currents are connected to the EOR-1DS.

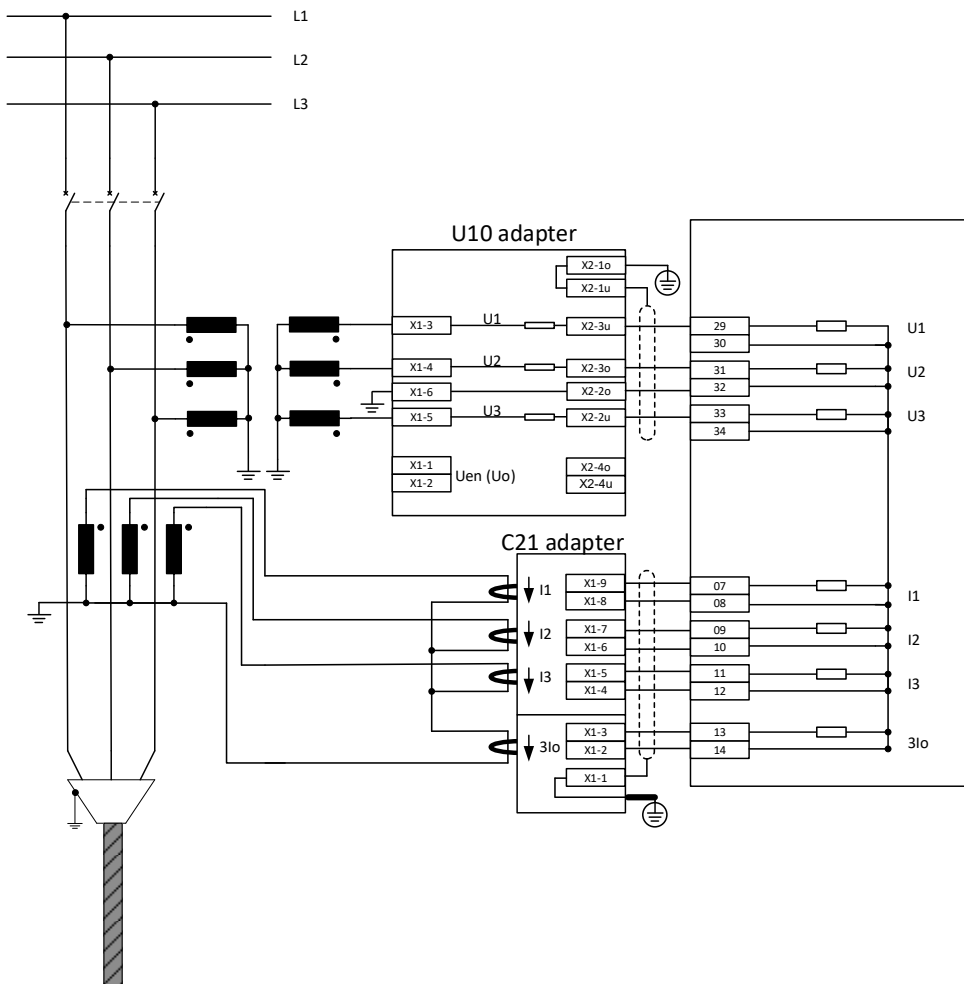


Connection of phase voltages and phase currents to the EOR-1DS using U10 and C21 adapters

We take care of it.

3.5.2.4 Connection to the busbar side neutral point of the current transducer

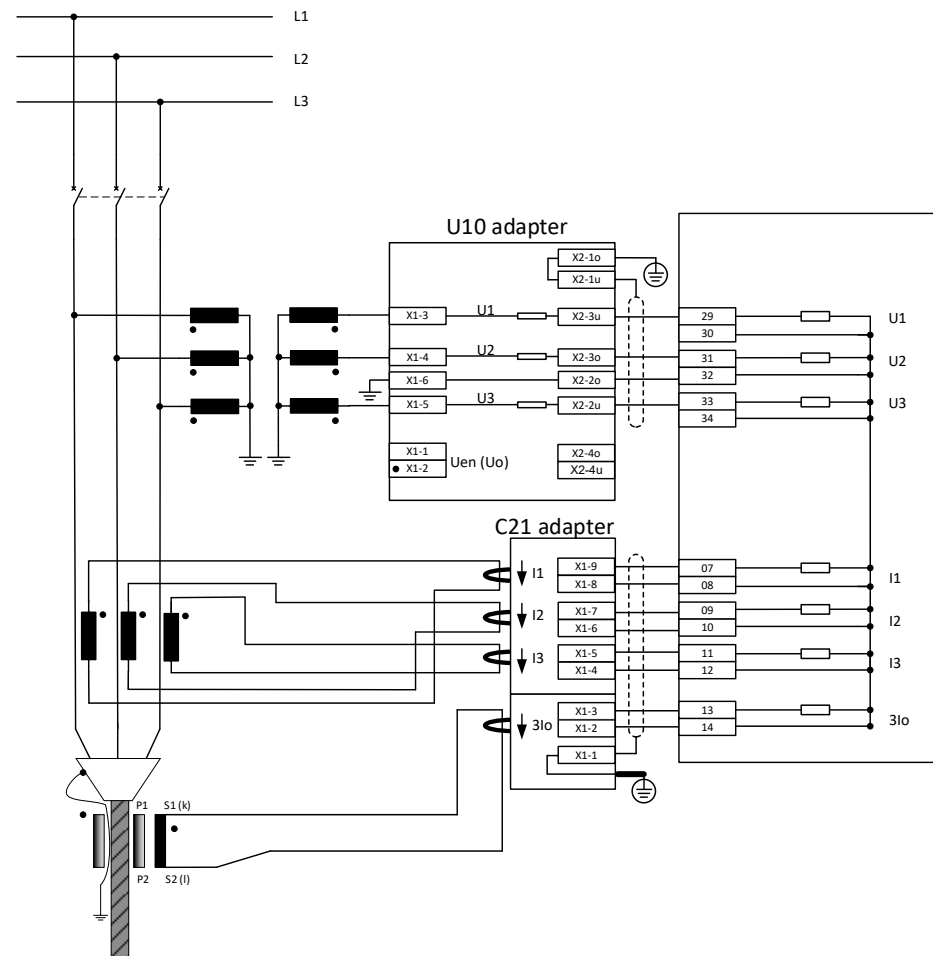
The voltage measurement is identical to chapter 3.5.2.3. However, the current measurement is wired in a way that a connection from one transducer is combined with the other two current transducers. The sum of the three phase currents (i. e. $3I_0$) can consequently be measured at this 'node'.



Connection of the phase voltages, phase currents and sum current ($3I_0$) with the neutral point in busbar direction using U10 and C21 adapters

3.5.2.5 Separate connection of phase voltages, phase currents and total current

Beside the measurements of phase voltages and phase currents there is also a measurement for the total current ($3I_0$).

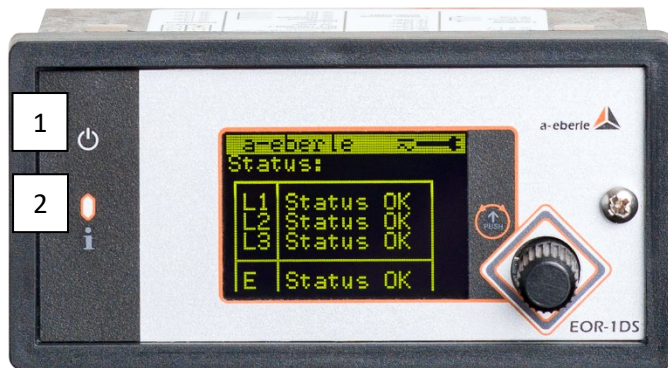


Connection of the phase voltages and phase currents with the neutral point in feeder direction as well as sum current ($3I_0$) using U10 and C21 adapters

4. Operation/Display

4.1 LED-assignment

The EOR-1DS has 2 LEDs on it's front panel. The green power LED signals a connected supply voltage. The second LED shows faults and the availability of fault records by blinkind in red. Additionally, the blinking red LED also signals and incorrect voltage measurement if the respective parameter is configured.



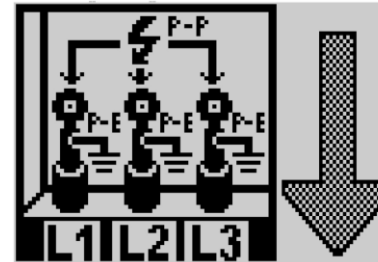
EOR-1DS front panel

- 1) Power LED
- 2) LED for fault notification

4.2 Menu navigation on the device

The EOR-1DS can be completely configured using the rotary switch. The display is normally in standby mode, meaning it is turned off. The display is activated by pressing the rotary switch on the front panel of the device.

At first the short circuit or earth fault notifications are shown using a three-phase image, if there are any faults to notify about.



Three phase short circuit in feeder direction

After pressing the rotary switch the overview pages are shown and can be scrolled through by turning the switch.

| a-eberle | | |
|----------|--------|----|
| Status: | | |
| L1 | Status | OK |
| L2 | Status | OK |
| L3 | Status | OK |
| E | Status | OK |

Status L1, L2, L3;

| a-eberle | | |
|-----------------|--------|-------|
| Uebersicht 1/2: | | |
| Methode | Relais | |
| >I | AN | R12-- |
| >Ie | AUS | R--3- |
| Wisch | AUS | R---- |
| Puls. | AN | R---4 |

overview locating methods, incl. Relays

Additionally, the present values of current, voltage and phase angle of all three phases, the zero-sequence system and the total powers for P, Q and S as well as the phase powers and zero sequence power can be displayed.

5. Technical specifications

5.1 Regulations and standards

DIN EN 61010-1:2020-3

DIN EN 61010-2-030:2011-07

DIN EN 61326-1:2013

CISPR 11:2015 (EN55011)



5.2 AC voltage input LRM

Capacitive voltage tap-off on LRM systems

| | |
|--------------------------------------|--------------|
| Measuring voltage | 0 ... 60 VAC |
| Shape of the curve | Sinus |
| Frequency range and fundamental wave | 48 .. 52 Hz |
| Burden | 10 MΩ |
| Accuracy | ± 3 % |

5.3 AC voltage input U06

Low power sensors with 200 kΩ rated burden and $U_n = 3,25 \text{ V} / \sqrt{3}$, e.g. sensors from ABB, Greenwood-Power, Zelisko, etc. (U_n adjustable)

| | |
|--------------------------------------|-------------|
| Measuring voltage | 0 ... 4 VAC |
| Shape of the curve | Sinus |
| Frequency range and fundamental wave | 48 .. 52 Hz |
| Burden | 200 kΩ |
| Accuracy | ± 1 % |

5.4 AC voltage input U07

Low Power sensors with 2 MΩ rated burden and $U_n = 3,25 \text{ V} / \sqrt{3}$, e.g. ABB, Greenwood-Power, Zelisko, etc. (U_n adjustable)

| | |
|--------------------------------------|-------------|
| Measuring voltage | 0 ... 4 VAC |
| Shape of the curve | Sinus |
| Frequency range and fundamental wave | 48 .. 52 Hz |
| Burden | 2 MΩ |
| Accuracy | ± 1 % |

5.5 AC voltage input U10 adapter

Classical voltage transducers with 100 V or 110 V; all values refer to the connection at U10 adapter; AC voltage input at indicator itself like U06 feature.

| | |
|--------------------------------------|---------------|
| Measuring voltage | 0 ... 150 VAC |
| Shape of the curve | Sinus |
| Frequency range and fundamental wave | 48 .. 52 Hz |
| Burden | 10 MΩ |
| Accuracy | ± 1,5 % |

5.6 AC current input C10

Inductive low power sensors with $U_n = 225 \text{ mV}$, e.g. ABB, Greenwood-Power, Zelisko, etc. (U_n adjustable)

| | |
|--------------------------------------|----------------|
| Measuring voltage | 0 ... 420 mVAC |
| Shape of the curve | Sinus |
| Frequency range and fundamental wave | 48 .. 52 Hz |
| Burden | 1 M Ω |
| Accuracy | $\pm 1,5 \%$ |

5.7 AC current input C11

SR55 Rogowski phase current transducer

| | |
|--------------------------------------|---|
| Measuring current | 0 ... 2500 A |
| Shape of the curve | Sinus |
| Frequency range and fundamental wave | 48 .. 52 Hz |
| Accuracy | $\pm 3 \%$ |
| Cable length sensor | 8 m |
| Cable diameter | 13 – 55 mm |
| Type of cable | <ul style="list-style-type: none"> • Only for shielded cables • Shield (ground) has to be returned for each phase so that currents in the shield do not influence the measurement |

5.8 AC current input C21/C25 adapter

Classical current transducers 1A / 5A secondary; all values refer to the connection at the C21 or C25 adapter; AC voltage input at indicator itself like C10 feature

| | |
|--------------------------------------|-----------------------|
| Measuring current | 0 ... 12 A |
| Shape of the curve | Sinus |
| Frequency range and fundamental wave | 48 .. 52 Hz |
| Power consumption | $\leq 0,1 \text{ VA}$ |
| Accuracy | $\pm 1,0 \%$ |

5.9 Binary inputs

| | |
|---------------|---------------------------|
| Input voltage | Potential-free usage only |
|---------------|---------------------------|

5.10 Binary outputs

| | |
|--|--|
| Potential Isolation | Galvanic isolation from all internal potentials |
| Contact load(max rating with ohmic load) | AC 150 V / 0,4 A DC 30 V / 2,0 A DC 150 V / 0,25 A |
| Type of use | In the secondary circuit, galvanically separated from the grid voltage |
| Minimum switching voltage | 1 mV |
| Switch. operations | $> 10^5$ electrical |
| Type | Bistable relays, parametrizable as normally open or closed |

5.11 Serial RS485 interface

| | |
|---------------------|--|
| Type | 2-wire RS485 interface |
| Potential isolation | Galvanic isolation |
| Connection | Shielded cable |
| 120 Ω termination | No termination included; external termination possible |

5.12 Supply voltage

Indication operation min. 4 h with long-life capacitor

| | |
|-----------------------|----------------------|
| DC | 20 V – 240 V |
| AC | 48 V – 240 V |
| Power consumption. DC | 0,6 W (max. 1,0 W) |
| Power consumption. AC | 1,9 VA (max. 2,6 VA) |

5.13 Rated conductor cross section

| | |
|------------------------------|---------------------|
| Length of end sleeve | 8 to 10 mm |
| Cross section with sleeve | 1,0 mm ² |
| Cross section without sleeve | 1,5 mm ² |

5.14 Measurement value recording

| | |
|--------------|---------|
| Non-volatile | ≤ 32 GB |
|--------------|---------|

5.15 Environment parameters

| | |
|-----------------------|--------------------------------|
| Reference temp. | 23°C ± 1 K |
| Operation | -20 °C ... +65 °C |
| Transport and storage | -25 °C ... +65 °C |
| Relative humidity | 5 % ... 95 % non-condensing |
| Altitude | Up to 2000 meters |

5.16 Limit-value monitoring

| | |
|------------------|------------------------------|
| Limit values | programmable |
| Response times | programmable |
| Alarm indicators | programmable: relay; display |

5.17 Weight

| | |
|--|---------|
| EOR-1DS C10 without adapter | 0,19 kg |
| EOR-1DS C11 with 3 rogowski coils | 1,24 kg |
| EOR-1DS C21/C25 with plug-on transducers | 0,31 kg |
| EOR-1DS C21/C25 with U10 adapter | 0,48 kg |

5.18 Electrical safety

| | |
|---|-----------|
| DIN EN 61010-1:2020-03 | |
| DIN EN 61010-2-030:2011-07 | |
| Degree of protection | IP40 |
| Protection class | II |
| Degree of pollution | 2 |
| Measurement category (only U10 adapter) | III/150 V |
| Measurement category (only U10 adapter) | II/300 V |
| Overvoltage category | II |

Operating voltages

| 50 V | 150 V | 240 V |
|-----------------------------|---------------|-------------------|
| Low power inputs, LRM input | Relay outputs | Auxiliary voltage |

5.19 Electromagnetic compatibility

| | |
|-----------|---------------------|
| Immunity | DIN EN 61326-1:2013 |
| Emissions | (CISPR11) (EN55011) |

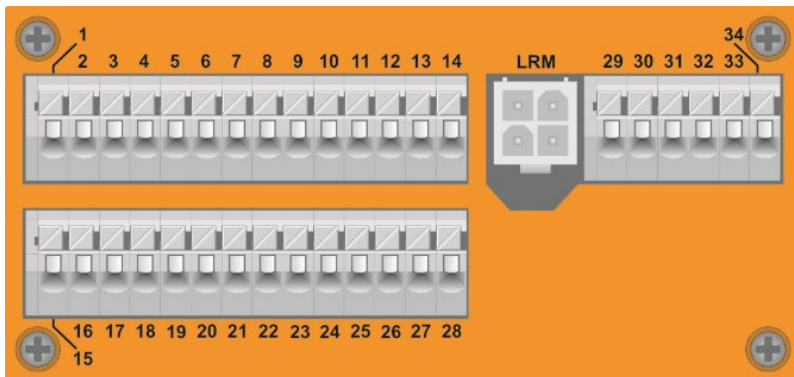
5.20 Connection / Terminals EOR-1DS as well as C21/C25 and U10 adapter



Please notice the security instructions and information given in the previous chapters regarding the connection of the device according to the characteristics ,C' and ,U' and according to the respective connection to low power sensors and transducers.



Notice the rated length of 8 to 10mm for sleeves or bare wires on all terminals.



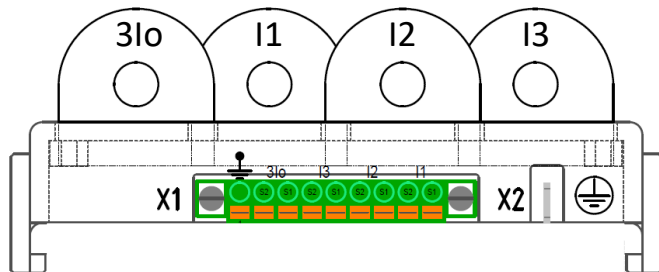
Terminals EOR-1DS

| Name | Function | Connector nr.. | Cross section[mm ²] |
|---|-------------------|----------------|---|
| Modbus | GND | 1 | 1,0 mm ² with sleeve 1,5 mm ² without sleeve |
| | A | 2 | |
| | B | 3 | |
| Reset external (use only with zero potential) | Reset | 4 | |
| Root (Reset external / Test external) | Root | 5 | |
| Test external (use only with zero potential) | Test | 6 | |
| Current sensor L1 | I1 | 7 | |
| | I1 GND | 8 | |
| Current sensor L2 | I2 | 9 | |
| | I2 GND | 10 | |
| Current sensor L3 | I3 | 11 | |
| | I3 GND | 12 | |
| Current sensor 3I0 | 3I0 | 13 | |
| | 3I0 GND | 14 | |
| Auxiliary voltage 20 – 240 VDC / 48 – 240 VAC | Auxiliary voltage | 15 | |
| | | 16 | |
| Not used | | 17-19 | |
| Blinking lamp BL4.1/BL6/BL7 | brown | 20 | |
| | white | 21 | |
| Not used | | 22 | |
| Not used | | 23 | |
| relays | root 1..4 | 24 | |
| | relay 1 / Status | 25 | |
| | relay 2 | 26 | |
| | relay 3 | 27 | |
| | relay 4 | 26 | |
| 4 terminal connector for LRM system (voltage measurement) | LRM | LRM | |
| Voltage sensor L1 | L1 | 29 | |
| | L1 GND | 30 | |
| Voltage sensor L2 | L2 | 31 | |
| | L2 GND | 32 | |
| Voltage sensor L3 | L3 | 33 | |
| | L3 GND | 34 | |

We take care of it.

C21/C25 Current adaptor for 1 / 5 A

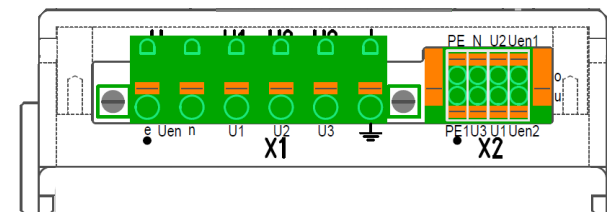
| No. | Name | Function | Colour Code | Connector adapter | Connector EOR-1DS | Cross-section |
|-----------------------------|---------------------------|--------------|-------------|-----------------------|-------------------|---------------------------|
| X1 | Phase current L1 | I1 - S1 | white | X1-9 | X5-10o | 0,5 – 1,5 mm ² |
| | | I1 - S2 | brown | X1-8 | X5-10u | |
| | Phase current L2 | I2 - S1 | green | X1-7 | X5-11o | |
| | | I2 - S2 | yellow | X1-6 | X5-11u | |
| | Phase current L3 | I3 - S1 | grey | X1-5 | X5-12o | |
| | | I3 - S2 | pink | X1-4 | X5-12u | |
| | Zero sequence current 3I0 | 3I0 - S1 | blue | X1-3 | X5-13o | |
| | | 3I0 - S2 | red | X1-2 | X5-13u | |
| | Cable shield | Cable shield | black | X1-1 | - | |
| ⊕ grounding cable shield | Cable shield | Cable shield | free choice | Flat connector 6,3 mm | PE | 2,5 mm ² |



Connection terminals current adaptor C21 (3I0 + I1..3) or. C25 (only 3I0)

U10 voltage adapter for 100 / 110 V

| No. | Name | Function | Colour Code | Connector adapter | Connector EOR-1DS | Cross section |
|------------------------|-------------------------|-------------|-------------|-------------------|-------------------|---------------------------|
| X1 | Zero voltage U0 | Uen - e | - | X1-1 | - | 0,5 – 2,5 mm ² |
| | | Uen - n | - | X1-2 | - | |
| | Phase voltage L1 | U1 | - | X1-3 | - | |
| | Phase voltage L2 | U2 | - | X1-4 | - | |
| | Phase voltage L3 | U3 | - | X1-5 | - | |
| | Measurement reference ⊕ | Mess-PE | - | X1-6 | - | |
| X2 | Zero voltage U0 | n.a. | - | - | - | 0,5 – 1,5 mm ² |
| | | n.a. | - | - | - | |
| | Phase voltage L1 | U1 | white | X2-3u | X5-6o | |
| | Phase voltage L2 | U2 | brown | X2-3o | X5-7o | |
| | Phase voltage L3 | U3 | green | X2-2u | X5-8o | |
| | Measurement reference ⊕ | PE | yellow | X2-2o | X5-7u | |
| Cable shield | Cable shield | black | X2-1u | - | | |
| Grounding cable shield | Cable shield | free choice | X2-1o | - | | |



Connection terminals U10 voltage adapter for 100 / 110 V

A. Eberle GmbH & Co. KG

Frankenstraße 160
D-90461 Nuremberg

Tel.: +49 (0) 911 / 62 81 08-0
Fax: +49 (0) 911 / 62 81 08 99
E-Mail: info@a-eberle.de

<http://www.a-eberle.de>

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