

Combined Earth Fault and Short Circuit Indicator

EOR-1DS

- ▶ Short circuit indication (directed/undirected)
- ▶ Earth fault detection (transient, pulse locating)
- ▶ Low power sensor inputs
- ▶ Opt. incl. current sensors or 1A/5A transformers
- ▶ Fault recorder (max. 32 GB)



1. Application

The combined **earth fault and short circuit indicator** type EOR-1DS can be used in compensated, isolated, low ohmic and solidly earthed medium voltage networks.

A core balanced current transformer (CBCT) is not necessary. The sensors have to be mounted on shielded cables.

During the operational state, the indicator must be connected to an external power supply, which is allowed to fail in case of a fault. A long life capacitor supplies the EOR-1DS for indication operation up to 4 h in case of a fault.

1.1 Earth fault detection

- Transient earth fault detection for compensated and isolated grids using the qu2 algorithms for
 - One time evaluation of the initial transient event at the beginning of an earth fault
 - Detection of low and high impedance faults
 - circular current elimination in loops
- Pulse location
 - Pulse location with complex evaluation
 - No separate core balanced current transformer (CBCT)
 - Elimination of circulating currents in ring feeder setups

1.2 Short circuit indication

For compensated, isolated and solidly earthed networks the EOR-1DS can be used as undirected short circuit indicator (only current measurement necessary) or as directed short circuit indicator (current and voltage measurement necessary).

- Phase selective short circuit indication
- Indication of short circuits to earth

1.3 SCADA connection

The EOR-1DS can be not only connected via four freely programmable relays and two fixed binary inputs (test, reset), but also with **Modbus RTU** protocol via RS485.

1.4 General Features

- OLED display
- Configuration in menu via turn/push control button, via MODBUS or via SD card with the help of a preconfigured parameter file
- Up to 32 GB memory for fault recording, log book and parameter set exchange via SD-card

1.5 Hardware variants



- EOR-1DS incl. 3 phase current sensors (SR55)
- EOR-1DS for low power sensors (only indicator)
- EOR-1DS with plug-on transd. 3IO + 3xLx (1 A / 5 A)
- EOR-1DS with plug-on transd. 3IO (1 A / 5 A)
- EOR-1DS with additional voltage adapter for classic 100 V measurement

2. Characteristics

2.1 qu2 algorithm (transient)

With the qu2 algorithm, transient earth faults can be selectively detected to a few kΩ. In the zero sequence system the healthy outputs can be considered as capacitors. To obtain a voltage shift $u_{0(t)}$, these capacitors have to be charged. This charge is created with the null current $i_{0(t)}$ and results in the charge $q_{0(t)}$. With healthy outputs this yields the equation $q_{0(t)} = C_0 u_{0(t)}$. When $u_{0(t)}$ is plotted on the x-axis and $q_{0(t)}$ on the y-axis of the qu-graph, this gives a straight line for healthy outputs. This behavior does not apply for faulty outputs. Figure 1 shows this behavior for a low impedance earth fault.

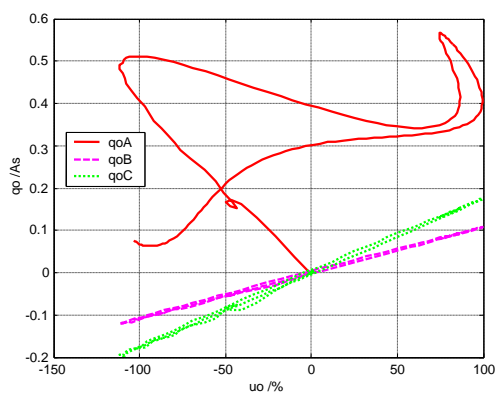


Figure 1: qu-graph for a low impedance earth fault

In parallel lines and meshed networks, circulating currents occur that can lead to an erroneous display. The improved qu2 algorithm eliminates this influence through linearization to the operating point and a downstream, non-linear filter. This algorithm is thus the first algorithm that really works in a meshed network and performs a successful, directional evaluation. This results in the following properties for the qu2 algorithm:

- Suitable for earth faults up to several kΩ
- The triggering threshold of the voltage shift u_{NE}
- The triggering current as an equivalent phase-earth capacitance
- Suppression of the earth fault in response to a selectable minimum duration of the earth fault (continuous earthing message)
- Recording of transient events in the logbook
- For the evaluation, either the measured or calculated u_{NE} from the three phase-earth voltages can be used
- Recording of the associated fault record with 400 ms of pre-event history and fix fault record length of 4 seconds

- Errors due to higher-frequency signals are greatly reduced by integral evaluation
- The qu2 algorithm, in comparison with the standard transient method, uses a much larger time range for the evaluation of the fault direction
- Reset of the indication by an external signal, in menu, automatically after a specified period or at the end of the earth fault

2.2 Pulse location without overcompensation

For compensated networks that have installed appropriate pulse sources, which generate a pulse signal during stationary state of an earth fault.

The pulse location method is based on evaluation of the three phase currents. Thereby the pulse location algorithm of the EOR-1DS has significant advantages against classical pulse location devices:

- Pulse location with complex evaluation
- No separate core balanced current transformer (CBCT) necessary
- Independent from the detuning of the Petersen coil
- Pulse location with distributed Petersen coils possible
- correct results with symmetrical and unsymmetrical pulse signals also for high impedance faults
- Reset of the indication by an external signal, in menu, automatically after a specified period or at the end of the earth fault

2.3 Non-directional short circuit

- Adjustable activation threshold
- Reset of the indication by an external signal, in menu, automatically after a specified period or at the end of the short circuit

2.4 Directional short circuit

- Directional indication through evaluation of the phase-earth voltages
- Adjustable activation threshold
- reset of the indication by an external signal, in menu, automatically after a specified period or at the end of the short circuit

2.5 Applicability of the methods

The following table shows the applicability of the methods for the EOR-1DS, depending on the accuracy class of the transformers and sensors.

| Available transformers / sensors | | | Transient qu2 | Pulse locating | Short circuit (directional) | Short circuit to earth (directional) | Short circuit (non-directional) | Short circuit to earth (non-directional) |
|----------------------------------|------------------|------------------|---------------|----------------|-----------------------------|--------------------------------------|---------------------------------|--|
| I ₀ | 3·I _L | 3·U _L | | | | | | |
| | X | | | X | | | X | X |
| | X | X | X | X | X | X | X | X |
| X | | | | | | | | X |
| X | X | | | X | | | X | X |
| X | | X | X | | | X | | X |
| X | X | X | X | X | X | X | X | X |

Legend of minimum requirements for class of accuracy of transducers and sensors:

| | |
|--|----------|
| | > cl. 1 |
| | <= cl. 1 |

* only applies for phase sensors/transducers, not for I₀ or U₀ sensors/transducers

2.6 SCADA connection

The EOR-1DS can be not only connected via four freely programmable relays and two fixed binary inputs (test, reset), but also with **Modbus RTU** protocol via RS485. In the standard register configuration all information and indications can be polled, as well as most of the parameters be set. Even during power supply fail all data points are still available (long life capacitor). Additional customer specific register assignments can be implemented.

2.7 Fault recorder with up to 32 GB

Fault records with a length of 4 seconds @ 2 kbps are recorded on the internal SD-card in case of a recognized short circuit or earth fault. During this, current, voltage and status messages are recorded. SD-cards with a memory size from 2 GB up to 32 GB are supported.

2.8 Logbook

- Displaying important messages directly on the EOR-1DS
- Detailed recording of the logbook on a supported SD card
- Recording in ASCII format and direct readable
- Events and changings in the configuration are recorded with a timestamp

2.9 Binary inputs

- 2 binary inputs with fixed functions (test and reset)
- Only use potential free

2.10 Binary outputs (relays)

- 4 free configurable relay outputs (bistable, NO)
- Permanent/Immediate or wipe contact (time adjustable)
- All indication algorithm and the status are freely programmable on the relays
- Multiple signals can be combined (OR-operation)

3. Menu navigation

The EOR-1DS can be configured completely via the display menu (turn/push control button). The display normally is in standby mode, i.e. in switched off mode. By pushing the turn/push control button on the front side of the device the display is activated.

At first potentially existing short circuit and/or earth fault indications will be displayed by a three-phase screen.

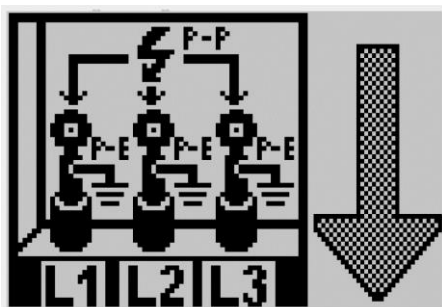


Figure 2: Three-phase short circuit in line direction

After pushing the turn/push control button overview displays will be shown. The different overview displays can be browsed by rotating the turn/push control button.

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

Figure 3: Status L1, L2, L3 and earth conductor

| a-eberle | | |
|--------------|-------|--------|
| summary 1/2: | | |
| methode | relay | |
| >I | ON | R 12-- |
| >Ie | OFF | R --3- |
| Wisch | OFF | R ---- |
| Puls. | ON | R ---4 |

Figure 4: Summary short circuit and earth fault methods incl. assigned relays

In the following screens the current values of measured currents, voltages and phase angles of all three phases as well as the zero sequence system and the total power for P, Q and S and the phases and zero sequence system are displayed.

| a-eberle | | |
|----------|----|---|
| current: | | |
| I1 | 23 | A |
| I2 | 22 | A |
| I3 | 23 | A |

| a-eberle | | |
|---------------------|------|----|
| Vol. Unom = 20 kV | | |
| U1 | 11.7 | KV |
| U2 | 11.6 | KV |
| U3 | 11.7 | KV |

| a-eberle | | |
|-------------|-----|----|
| 3I0, U0, φ0 | | |
| 3I0 | 0.8 | A |
| U0 | 0.2 | KV |
| φ0 | 0.5 | ° |

| a-eberle | | |
|---------------|-----|----|
| active power: | | |
| P1 | 120 | kW |
| P2 | 123 | kW |
| P3 | 119 | kW |
| P0 | 3 | kW |

Figure 5: Summary of current, voltage, zero sequence system and active power

By pushing the turn/push control button again the main menu can be entered, in which all parameters can be set.

| → 1 | |
|------------|-------------|
| Main Menu: | |
| | setting |
| → | test/reset |
| | system |
| | display off |
| | SD card |
| | back |

Figure 6: Main menu for parameterization

4. Technical specifications

4.1 Regulations and standards

DIN EN 61010-1:2020-03

DIN EN 61010-2-030:2011-07

DIN EN 61326-1:2013

CISPR 11:2015 (EN55011)



4.2 AC voltage input LRM

Capacitive voltage tap-off on LRM systems

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

4.3 AC voltage input low power U06

Low power sensors with 200 kΩ rated burden and $U_r = 3,25 \text{ V} / \sqrt{3}$ e.g. Zelisko SMVS (U_n settable)

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

4.4 AC voltage input low power U07

Low power sensors with 2 MΩ rated burden and $U_r = 3,25 \text{ V} / \sqrt{3}$ e.g. Zelisko SMVS (U_n settable)

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

4.5 AC voltage input U10

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

| | |
|---|---------------|
| Measuring voltage | 0 ... 150 VAC |
| Shape of the curve | Sine |
| Frequency range of the fundamental wave | 48 ... 52 Hz |
| Burden | 10 MΩ |
| Accuracy | +/- 1.5 % |

4.6 AC current input low power C10

Inductive low power sensors with $U_r = 225 \text{ mV}$, e.g. Zelisko SMCS (U_n settable)

| | |
|---|----------------|
| Measuring voltage | 0 ... 420 mVAC |
| Shape of the curve | Sine |
| Frequency range of the fundamental wave | 48 ... 52 Hz |
| Internal consumption | Burden 1 MΩ |
| Accuracy | +/- 1% |

4.7 AC current input C11

SR55 Rogowski phase current transformer

| | |
|---|--|
| Measuring current | 0 ... 2500 A |
| Shape of the curve | Sinus |
| Frequency range of the fundamental wave | 48 ... 52 Hz |
| Accuracy | +/- 3% |
| Cable length | 8 m |
| Conductor diameter | 13 – 55 mm |
| Conductor type | <ul style="list-style-type: none"> • Only for shielded conductors • Conductor shield (ground) must be led back for each phase, so a current on the shield does not influence the measurement |

We take care of it.

4.8 AC current input C21/C25

Classical current transducers 1 A / 5 A secondary

| | |
|---|--------------|
| Measuring voltage | 0 ... 12 A |
| Shape of the curve | Sinus |
| Frequency range of the fundamental wave | 48 ... 52 Hz |
| Internal consumption | ≤ 0.1 VA |
| Accuracy | 2.0 |

4.9 Supply voltage

Indication operation min. 4 h due 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) |

4.10 Nominal conductor diameter

| | |
|--------------------------|---------------------|
| With wire end ferrule | 1 mm ² |
| Without wire end ferrule | 1,5 mm ² |

4.11 Binary inputs

| | |
|---------------|----------------|
| Input voltage | Potential free |
|---------------|----------------|

4.12 Binary outputs

| | |
|--|--|
| Electrical isolation | Electrically isolated from all other device inter potentials |
| Contact load (maximal values for ohmic load) | AC 150 V / 0,4 A DC 30 V / 2 A DC 150 V / 0,25 A |
| Minimal switching voltage | 1 mV |
| Amount of switching operation | >10 ⁵ electrical |
| Type | Bistable relays |

4.13 Limit value monitoring

| | |
|----------------|----------------------------------|
| Limit value | Programmable |
| Response time | Programmable |
| Alarm displays | Programmable: relays, display |

4.14 Measurement value recording

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

4.15 Environmental parameters

| | |
|-----------------------------|------------------------------|
| Reference temperature | 23°C ± 1 K |
| Function | -20 °C ... +65 °C |
| Transport and storage | -25 °C ... +65 °C |
| Relative humidity | 5% ... 95% not condensing |
| Operating altitude a. s. l. | Up to 2000 meters |

4.16 Weight

| | |
|--------------------------------------|---------|
| EOR-1DS C10 without adapter | 0.19 kg |
| EOR-1DS C11 with 3x Rogowski sensors | 1.24 kg |
| EOR-1DS C21/C25 with plug-on transd. | 0.31 kg |
| EOR-1DS C21/C25 with U10 Adapter | 0.48 kg |

4.17 Electrical safety

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

Working voltages

| 50 V | 150 V | 240 V |
|-----------------------------|---------------|--------------|
| Low power inputs, LRM input | Relay outputs | Power supply |

4.18 Electromagnetic compatibility

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

4.19 Special features EOR-1DS

- SD card behind removable front, for access release the screw on the front side
- In contrast to the EOR-1D, there is no battery behind the removable front, because the battery was replaced with a long life capacitor
- SD card useable for firmware updates, parameter updates, fault record and logbook



Figure 7: EOR-1DS with demounted front plate for SD card access

4.20 Indicator dimensions

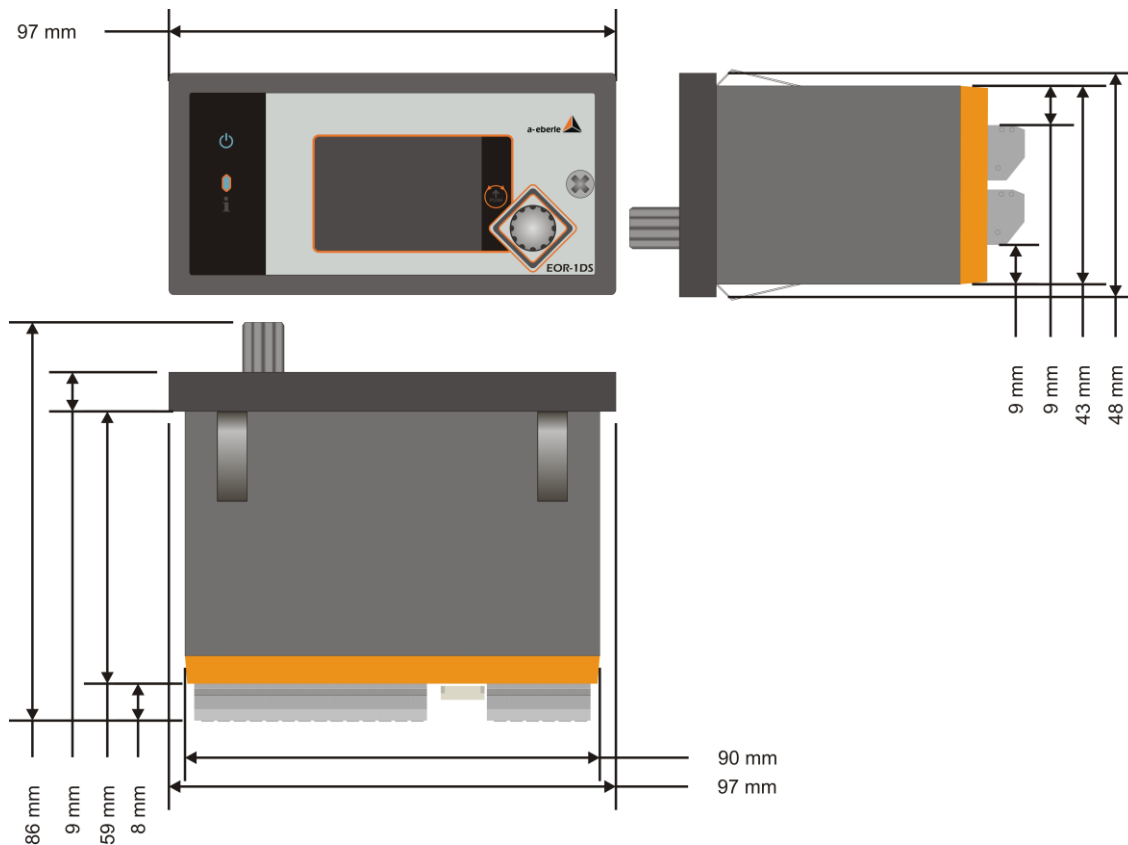


Figure 8: Dimensions EOR-1DS



Necessary panel cutout

92+0,8 mm x 45+0,6 mm (IEC 61554 / DIN 43700)

We take care of it.

4.21 Dimensions phase current sensors (part of EOR-1DS art. 119.9006.11xx)



Figure 9: Installation phase current sensor

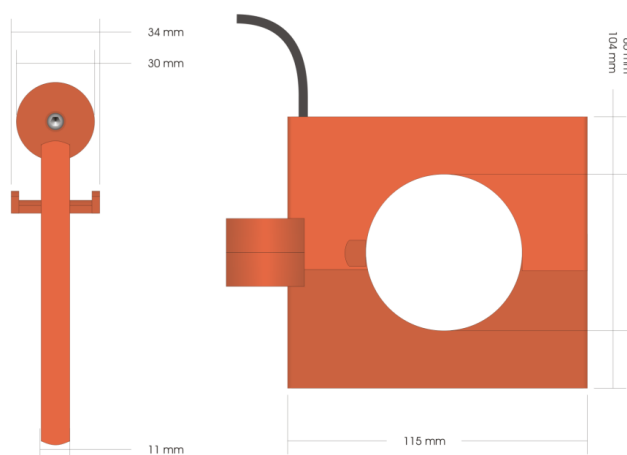


Figure 10: Dimensions phase current sensor

ATTENTION!

Conductor shield must be led back

3x Rogowski coil sensors included in set with article number 119.9006.11xx

4.22 Dimensions current adapter C21/C25 and voltage adapter U10

The following picture shows the current adapter C21 for classical current measurement of 1 A / 5 A values. Feature C25 has in comparison with feature C21 only the 3I₀ current transducer. The transducers for I1..3 are not available with this feature.

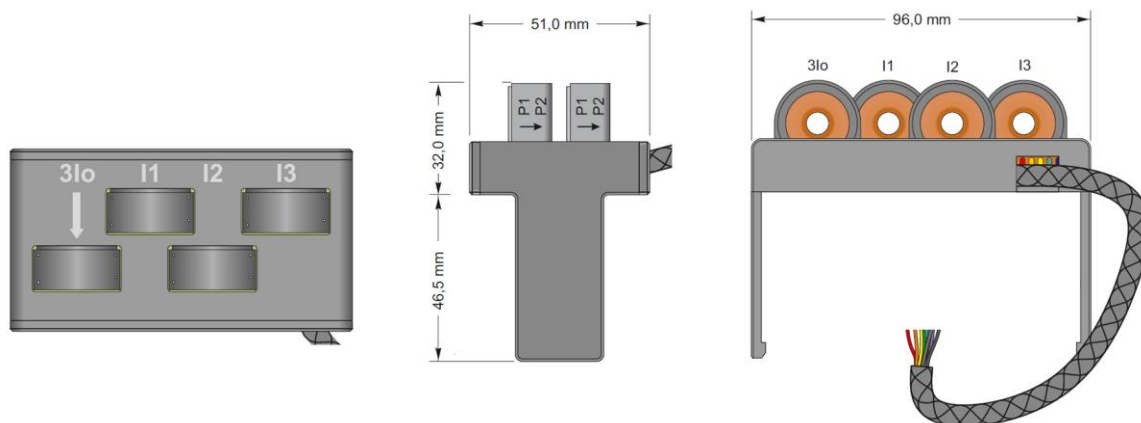


Figure 11: Dimensions of adapter for classical current measurement feature C21

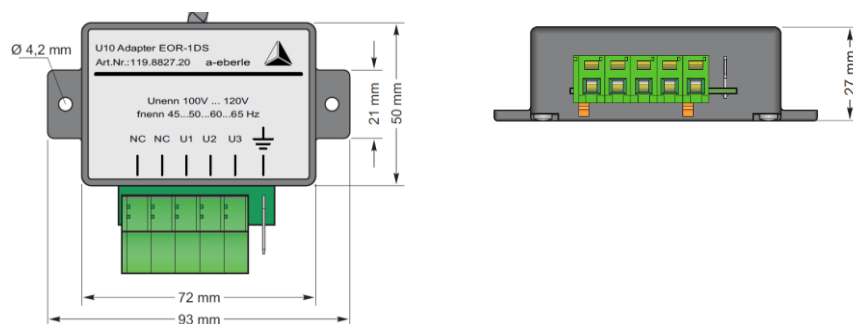


Figure 12: Dimensions of voltage measurement adapter for 100 V / 110 V transducers; order code U10

4.23 Terminal assignment indicator

| PIN | Function |
|-----|--|
| 1 | Modbus GND |
| 2 | Modbus A |
| 3 | Modbus B |
| 4 | Reset extern (use only potential free) |
| 5 | Common (Reset extern / Test extern) |
| 6 | Test extern (use only potential free) |
| 7 | Current sensor L1 |
| 8 | Current sensor L1 GND |
| 9 | Current sensor L2 |
| 10 | Current sensor L2 GND |
| 11 | Current sensor L3 |
| 12 | Current sensor L3 GND |
| 13 | Current sensor 3I0 |
| 14 | Current sensor 3I0 GND |

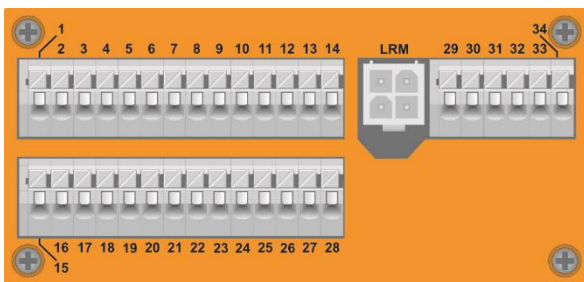


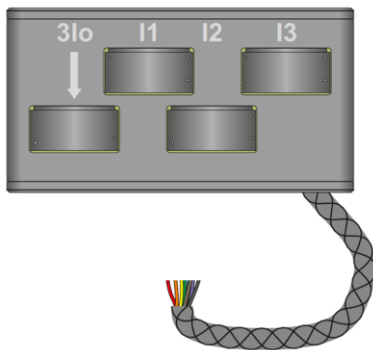
Figure 13: Pins EOR-1DS

| PIN | Function |
|-----|---|
| LRM | 4 pin socket for LRM system (U-measurement) |
| 29 | Voltage sensor L1 |
| 30 | Voltage sensor GND |
| 31 | Voltage sensor L2 |
| 32 | Voltage sensor GND |
| 33 | Voltage sensor L3 |
| 34 | Voltage sensor GND |

| PIN | Function |
|-------|---|
| 15 | Auxiliary voltage 20..240 VDC / 48..240 VAC |
| 16 | Auxiliary voltage 20..240 VDC / 48..240 VAC |
| 17-19 | not used |
| 20 | Flashing lights BL4.1/BL6/BL7 (brown) |
| 21 | Flashing lights BL4.1/BL6/BL7 (white) |
| 22 | not used |
| 23 | not used |
| 24 | Relays 1..4 Common |
| 25 | Relay 1 / status |
| 26 | Relay 2 |
| 27 | Relay 3 |
| 28 | Relay 4 |

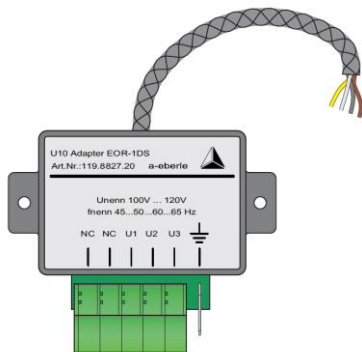
We take care of it.

4.24 Terminal assignment C21/C25 current adapter



| PIN indicator | Function | Cable colour |
|----------------|------------------------|--------------|
| 7 (only C21) | Current sensor L1 | Orange |
| 8 (only C21) | Current sensor L1 GND | Red |
| 9 (only C21) | Current sensor L2 | Green |
| 10 (only C21) | Current sensor L2 GND | Yellow |
| 11 (only C21) | Current sensor L3 | Violet |
| 12 (only C21) | Current sensor L3 GND | Blue |
| 13 (C21 & C25) | Current sensor 3I0 | Brown |
| 14 (C21 & C25) | Current sensor 3I0 GND | Black |

4.25 Terminal assignment U10 voltage adapter



| PIN indicator | Function | Cable colour |
|---------------|-------------|--------------|
| 29 | Voltage L1 | Brown |
| 30 | Voltage GND | Yellow |
| 31 | Voltage L2 | White |
| 33 | Voltage L3 | Grey |

5. Accessories for EOR-1DS

5.1 External flashing lights

Optional the external flashing lights type BL4.1 and BL7 for wall mounting and BL6 for surface mounting are available. Typ BL7 verfügt zusätzlich über eine Richtungsanzeige.



Figure 1: Type BL4.1



Figure 2: Type BL7



Figure 3: Type BL6

| Type | Description | Cable length | Article number |
|-------|---|--------------|----------------|
| BL4.1 | Without direction indication for wall mounting | 6m | 119.9100.06 |
| BL7 | With direction indication for wall mounting | 6m | 119.9103.06 |
| BL6 | Without direction indication for surface mounting | 6m | 119.9102.06 |

5.2 LRM Adapter cables

In addition, the following LRM – adapter cables are available optionally for connection of the voltage of a LRM – system to the AMP socket of the EOR-1DS:



Figure 4: LRM adapter



Figure 5: Y-LRM adapter

| Type | Description | Article number |
|---------------|--|----------------|
| LRM adapter | 4 pole AMP-socket on both ends | 582.8114.xx |
| Y-LRM adapter | 3x flat plug / socket on 4 pole AMP socket | 582.8113.xx |



The EOR-1DS does not provide a second capacity for measurement of the voltage on a capacitive voltage divider. An appropriate device has to be used that provides a capacity corresponding to the capacitive voltage divider (e.g. Capdis or WEGA system). The EOR-1DS can only be connected in parallel to such a device with a LRM – adapter cable.

5.3 Low power sensors

Zelisko sensor (split core type) 1 set (3 pcs.)

Phase current sensor (split core type) for power and short circuit measurement 300 A / 0.225 V cl. 0.5 up to 200 % afterwards 5P10 (Inner-Ø: 55 mm). Also available as preselected set.

| Sensor type | Cable length | Article no. |
|---------------------------|--------------|-------------|
| SMCS/T-JW1002 | 3.7m | 330.1510 |
| SMCS/T-JW1002 preselected | 3.7 m | 330.1510.00 |



Zelisko sensor (closed ring core type) 1 set (3 pcs.)

Phase current sensor (closed ring core type) for power and short circuit measurement 300 A / 0.225 V cl. 0.5 up to 200 % afterwards 5P10 (Inner-Ø: 82 mm). Directly mountable on the bushings of compact switch gears. Also available as preselected set.

| Sensor type | Cable length | Article no. |
|-------------------------|--------------|-------------|
| SMCS-JW1001 | 3.7m | 330.1511 |
| SMCS-JW1001 preselected | 3.7 m | 330.1511.00 |



Zelisko 3-phase (I1+I2+I3) + Core Balanced Current Sensor (3Io) multi-function sensor (closed ring core type)

Phase current sensor for power and short circuit measurement 300 A / 0.225 V cl. 0.5 up to 200 % afterwards 5P10 (Inner-Ø: 84 mm).

| Sensor type | Cable length | Article no. |
|--------------|--------------|-------------|
| SMCS3-JW1004 | 3.7m | 330.1514 |



Zelisko sensor (split core type) Core Balanced Current Sensor (3Io)

Core Balanced Current Sensor for 3Io measurement with a ratio of 60 A / 0.225 V; (Inner-Ø: 120 mm), cl. 0.5.

| Sensor type | Cable length | Article no. |
|--------------------|--------------|-------------|
| GAE120/SENS-JW1003 | 3.7m | 330.1515 |



Zelisko combined current and voltage sensor (up to 12/24/36 kV) for open air facility

The open facility sensor combines the functions of a current and voltage sensor in one device. Due to the construction design and the special cast resin mixture the product can be used outdoors. The combined sensor is available up to an isolation level of 36 kV. (current sensor cl. 0.5 5P20 / voltage sensor cl 0.5 3P)

| Sensor type | Cable length | Article no. |
|-----------------------------------|--------------|-------------|
| SMVS-K1112 (<= 12 kV isol. level) | - | 330.1512.12 |
| SMVS-K1112 (<= 24 kV isol. level) | - | 330.1512.24 |
| SMVS-K1112 (<= 36 kV isol. level) | - | 330.1512.36 |



5.4 Current transducers with low nominal load

Phase current transformer für load current and short circuit detection ELEQ TQ50 (Inside-Ø: 42mm, rated burden 0,5 VA)

| Transducer type | Length of cable | Article no. |
|------------------|-----------------|-------------|
| 250/1 A (KI.1) | 5.0 m | 330.1502 |
| 300/1 A (KI.1) | 5.0 m | 330.1503 |
| 400/1 A (KI.0,5) | 5.0 m | 330.1504 |
| 500/1 A (KI.0,5) | 5.0 m | 330.1505 |
| 600/1 A (KI.0,5) | 5.0 m | 330.1506 |



6. Order specifications

For determining the order details:

- Only one unit can be ordered for codes with the same capital letter.
- When a code's capital letter is followed only by zeros, the code may be omitted.

| Characteristic | CODE |
|--|--|
| Combined short circuit & earth fault indicator EOR-1DS <ul style="list-style-type: none"> ● For undirected and directed short circuit and earth fault indication with fault records and logbook on SD card for easy fault analysis ● Power meter ● Switch panel mounting with 4 relays and 2 binary inputs ● Low power voltage sensor inputs 3x ULx and Low power current sensor inputs 1x 3I0 + 3x ILx ● Push-in terminals ● LRM interface for capacitive voltage input ● Incl. MODBUS RTU protocol ● 8GB-Flash-memory ● Wide-range power supply, long-life capacitor for >4h indication operation | EOR-1DS |
| Input configuration current <ul style="list-style-type: none"> ● Without additional current sensors Art.-No.: 119.9006.10xx ● Current measurement via rogowski coil sensors directly at medium voltage cables; Incl. 3 phase current sensors with each 8 m connection cable, no core balanced CT required Art.-No.: 119.9006.11xx ● Current measurement on classical current transducers 1A / 5A; Incl. plug-on adapter for measurement of 1x 3I0 + 3x ILx Art.-No.: 119.9006.21xx ● Current measurement on classical current transducers 1A / 5A; Incl. plug-on adapter for measurement of 1x 3I0 Art.-No.: 119.9006.25xx | C10 C11 C21 C25 |
| Input configuration voltage <ul style="list-style-type: none"> ● Low power voltage sensor inputs with 200 kΩ burden Art.-No.: 119.9006.xx06 ● Low power voltage sensor inputs with 2 MΩ burden Art.-No.: 119.9006.xx07 ● 4 voltage inputs up to 120V for classical 100V VT (via additional adapter) Art.-No.: 119.9006.xx10 | U06 U07 U10 |
| Customer specific parameterization <ul style="list-style-type: none"> ● Without ● With | K0 K1 |

| Accessories | article number |
|--|---|
| <p>Adapter for DIN-rail mounting of the EOR-1DS</p> <ul style="list-style-type: none"> ● Mounting the EOR-1DS on an existing DIN-rail, set of 2 DIN-rail adapters (left and right housing side), existing screws of EOR-1DS (rear side) must be re-used to mount the adapter on the EOR-1DS | 564.0495 |
| <p>Adapter cable EOR-1DS</p> <ul style="list-style-type: none"> ● LRM Y-adapter cable for 4,8 mm flat socket <ul style="list-style-type: none"> ○ cable length 0,3 m ○ cable length 1,0 m ○ cable length 1,5 m ● LRM connection cable for 2 x 4-pol socket <ul style="list-style-type: none"> ○ cable length 0,3 m ○ cable length 1,0 m ○ cable length 1,5 m | 582.8113.03 582.8113.10 582.8113.15 582.8114.03 582.8114.10 582.8114.15 |
| <p>Flashing lights EOR-1DS</p> <ul style="list-style-type: none"> ● BL6 without direction indication for surface mounting, cable length 6 m ● BL4.1 without direction indication for wall mounting, cable length 6 m ● BL7 with direction indication for wall mounting, cable length 6 m | 119.9102.06 119.9100.06 119.9103.06 |
| <p>Low power sensors (see also chapter 5.3)</p> <ul style="list-style-type: none"> ● 1 set (3 pcs.) sensors, split core type <ul style="list-style-type: none"> ○ Zelisko SMCS/T-JW1002, length of conn. cable 3.7 m ○ Zelisko SMCS/T-JW1002, preselected, length of conn. cable 3.7 m ● 1 set (3 pcs.) sensors, closed ring core type <ul style="list-style-type: none"> ○ Zelisko SMCS-JW1001, length of conn. cable 3.7 m ○ Zelisko SMCS-JW1001, preselected, length of conn. cable 3.7 m ● 1x 3-phase (I1+I2+I3) + Core Balanced Current Sensor (3Io) multi-function sensor, closed ring core type <ul style="list-style-type: none"> ○ Zelisko SMCS3-JW1004, length of conn. cable 3.7 m ● 1x Core Balanced Current Sensor (3Io), split core type <ul style="list-style-type: none"> ○ Zelisko GAE120/SENS-JW1003, length of conn. cable 3.7 m ● 1x combined current and voltage sensor (up to 12/24/36 kV) for open air facility <ul style="list-style-type: none"> ○ Zelisko SMVS-K1112 (up to 12 kV isolation level) ○ Zelisko SMVS-K1112 (up to 24 kV isolation level) ○ Zelisko SMVS-K1112 (up to 36 kV isolation level) | 330.1510 330.1510.00 330.1511 330.1511.00 330.1514 330.1515 330.1512.12 330.1512.24 330.1512.36 |

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| Accessories | article number |
|---|-----------------|
| Current transducers with low nominal load (see also chapter 5.4) | |
| ● Phase current transformer für load current and short circuit detection ELEQ | |
| TQ50 (Inside-Ø: 42mm, rated burden 0.5 VA) | |
| ○ ELEQ TQ50 250/1 A (cl.1), length of connection cable 5.0 m | 330.1502 |
| ○ ELEQ TQ50 300/1 A (cl.1), length of connection cable 5.0 m | 330.1503 |
| ○ ELEQ TQ50 400/1 A (cl.0.5), length of connection cable 5.0 m | 330.1504 |
| ○ ELEQ TQ50 500/1 A (cl.0.5), length of connection cable 5.0 m | 330.1505 |
| ○ ELEQ TQ50 600/1 A (cl.0.5), length of connection cable 5.0 m | 330.1506 |

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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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