ESU-D2

Insulation monitoring relay for ungrounded DC-networks
DIN Rail mounting according to DIN 43 880

Type: ESU-D2/… V
Earth insulation resistance monitoring relay
Pre alarm 1 CO and main alarm 1 NO + 1 CO contact outputs 5 A / 250 V
UC 24 … 48 V, UC 110 … 240 V operating voltages, monitoring of
DC 12 … 48 V power supply networks. Monitoring of earth interruption on the device.
The device measures single or combined resistances occurring against + or – pole of the
DC network. Adjustable alarm delay. Proved reliability in rolling stock applications.

Monitoring function

The ESU-D2 monitors the isolation resistance in non-grounded DC-networks (24 – 48 V).
Two alarm steps (prealarm AL1 and main alarm AL2) are indicated via separate output contacts.
Displays: bargraph-display of the measured earthing resistance (green = ok). Two red LEDs show the ground tendency towards plus (+) or minus (–).
Output terminals 5 V for the external display of the earthing resistance (0,1 V/kΩ).
Test functions: Periodic automatic check, also with key “Test”.

Measuring circuit data
Measuring / setting range for pre alarm 1 … 50 kΩ / 4 … 30 kΩ
Constant value for main alarm 4 kΩ
Tolerance ≤ 10 %
Overvoltage alarm level of DC network 60 V
Input current + → - ≤ 5 mA
Sampling current pulses +/- → earth 0.2 mA
Overvoltage safety from earth to +/- poles AC 250 V
Max. capacity +/- → earth 1.5 µF 1)

1) Types for capacitances until 60 µF on request

Time data
Alarm delay time adjustment range 0.1 … 10 s
Fault detection time 800 ms
Auto reset time, fail to OK 1 s

Contacts
Type / Material 2 CO, 1 NO micro disconnection / AgNi
Rated operational current / min. contact load 5 A / 1 mA 12 V
Max. switching voltage (Fig. 1) 250 V

Power supply
Nominal voltage
Operation voltage range 18 … 60 V 88 … 265 V
Power consumption 2 W 2 W
Voltage failure buffering ≥ 50 ms ≥ 50 ms

Insulation
Test voltage contacts to other circuits 2 kVrms 1 minute

General specifications
Ambient temperature storage /operation -40 … 85 °C / -10 … 60 °C
Ingress protection degree Housing: IP 40, terminals: IP 20
Max. screw torque 0.5 Nm
Weight 250 g

Standard types
UC 110-240 ESU-D2/UC110-240V
UC24-48 ESU-D2/UC24-48V

Technical approvals, conformities
EN 60947

Connection diagram

Fig. 1 DC load limit curve

Dimensions [mm]

This issue replaces all previous issues. Availability, errors and specifications subject to change without notice.