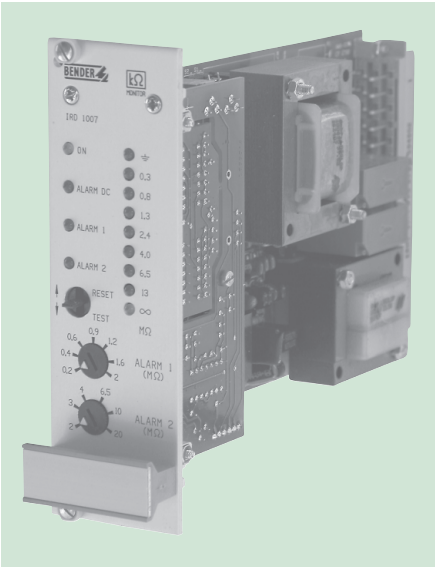
A-ISOMETER® IRD1007L...

Insulation monitoring device for unearthed AC and 3(N) AC systems (IT systems)



IRD1007L...

Device characteristics

- Insulation monitoring device for IT AC / 3(N) AC systems 0…575 V
- Nominal voltage extendable via coupling devices
- Two separately adjustable response values
- Response range 2 kΩ…20 MΩ in different variants
- Adjustable response delay 0…90 s
- Power On LED, alarm LEDs signalling insulation fault ALARM 1, ALARM 2, DC
- LED bar graph indicator for insulation resistance indication
- Connection for external kΩ indication
- Combined TEST and RESET button
- Connection external TEST / RESET button
- Alarm relay with two voltage-free changeover contacts
- N/O / N/C operation, selectable
- Alarm output with optocoupler
- Input for measurement suppression
- Fault memory, selectable

Product description

The A-ISOMETERs® of the IRD1007L series monitor the insulation resistance of unearthed AC and three-phase systems (IT systems) AC / 3(N) AC 0…793 V. In combination with a coupling device, the A-ISOMETERs® can also be used for higher voltages. Due to a separate supply voltage source it is possible to monitor de-energized systems.

The systems to be monitored should not include DC components. Due to the measuring principle, insulation faults behind directly connected rectifiers are indicated with increased response sensitivity. The preset response values apply to the pure AC system.

Two separately adjustable response values respectively alarm relays allow to distinguish between prewarning and alarm.

Application

- AC / 3(N) AC main circuits (without directly connected rectifiers) such as motors, pumps, rolling mills without variable-speed drives, air cooling and air conditioning systems, lighting systems, heating systems, mobile generators, building installation practice etc.
- 19" systems for plug-in units

Function

If the insulation resistance between the system conductors and earth falls below the set response value, the alarm relay switches and the alarm LEDs light up. In case of interruption of the system and earth connection, the alarm LEDs flash. Different alarm LEDs Alarm1, Alarm2 and Alarm DC, allow to distinguish between insulation faults on the AC and the DC side. The measured value is indicated on the LED bar graph indicator or an externally connected measuring instrument. In this way any changes such as the connection of branch circuits can easily be detected. The fault message can be stored. The fault memory can be reset by pressing the RESET button. By pressing the TEST button, the function of the device can be tested. The optocoupler output and the alarm relay switches respectively flashes at the same time with switch S5 in closed position. The input "measurement suppression" can be used for deactivating the measurement process, e. g. during insulation fault location.

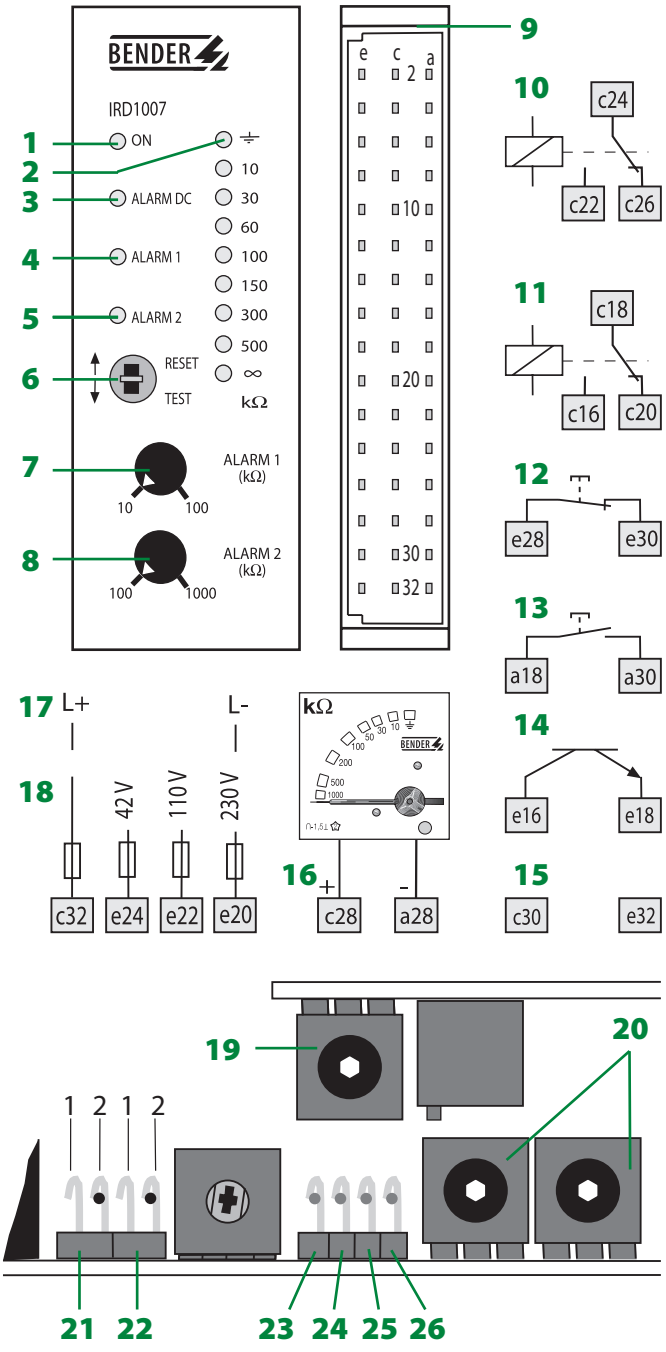
Measuring principle

Superimposed DC voltage with reversing stage (see chapter annex – measurement technology).

Standards

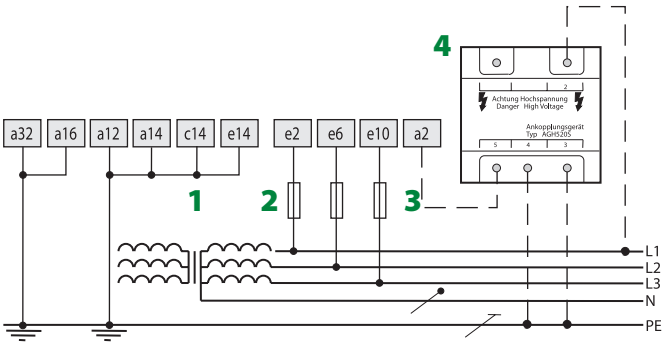
The IRD1007L… series complies with the standards: DIN EN 61557-8 (VDE 0413 part 8): 1998-05; EN 61557-8: 1997-03, IEC 61557-8: 1997-02, ASTM F 1669M-9.

Wiring diagram – operating elements



1 - Power On LED
2 - LED bar graph indicator
3 - Alarm LED DC faults
4 - Alarm LED for ALARM 1
5 - Alarm LED for ALARM 2
6 - Combined TEST and RESET button
7 - Adjustable response value R_{an1} / ALARM 1
8 - Adjustable response value R_{an2} / ALARM 2
9 - Plug connector E48
10 - Alarm relay switches when the insulation value falls below the preset response value R_{an1} (ALARM 1)
11 - Alarm relay switches when the insulation value falls below the preset response value R_{an2} (ALARM 2)
12 - External RESET button, if required
13 - External TEST button, if required
14 - Optocoupler output, floating, switches together with alarm relay ALARM 1 and flashes when S5 is in closed position.
15 - Measurement suppression by external contact (N/O contact)
16 - External kΩ meter
17 - U_S DC see nameplate
18 - U_S AC, fuse max. 4 A
19 - Adjustable ON delay 0…90 s
20 - Adjustable response delay 0…10 s
21 - S1 Operating principle alarm relay 1:
1 – N / O operation 2 – N / C operation
22 - S1 Operating principle alarm relay 2:
1 – N / O operation 2 – N / C operation
23 - S3 Latching properties of the alarm indications
S3 On storing ALARM1 S3 Off no latching properties
24 - S4 Latching properties of the alarm indications
S4 On storing ALARM2 S4 Off no latching properties
25 - S5 Switch for flashing indications, S5 Off indication ALARM 1 flashing
26 - S6 Switch for flashing indications, S6 Off indication ALARM 2 flashing

Wiring diagram – system connection



1 - U_n – 3 / (N) / AC 50…400 Hz 0…575 V
2 - Fuse max. 6 A
3 - Connection for coupling device at U_n > 575 V
4 - AGH520S U_n 0…7200 V

Response values / measuring circuit

Type	Internal resistance R_i	Response value 1 R_{an1}	Response value 2 R_{an2}	Max. extraneous d.c. voltage U_{fg}
IRD1007L-3	≥ 28 kΩ	2 kΩ…20 kΩ	20 kΩ…200 kΩ	≤ 230 V
IRD1007L-4	≥ 120 kΩ	10 kΩ…100 kΩ	100 kΩ…1 MΩ	≤ 500 V
IRD1007L-5	≥ 240 kΩ	20 kΩ…200 kΩ	200 kΩ…2 MΩ	≤ 500 V
IRD1007L-6	≥ 1.2 MΩ	100 kΩ…1 MΩ	1 MΩ…10 MΩ	≤ 500 V
IRD1007L-7	≥ 2.8 MΩ	200 kΩ…2 MΩ	2 MΩ…20 MΩ	≤ 500 V

Other supply voltages on request.

Ordering details

Type	Nominal system voltage U_n	Supply voltage U_S	Art. No.
IRD1007L-3	AC / 3(N) AC 0…575 V	AC 42 / 110 / 230 V	B 913 571
IRD1007L-4	AC / 3(N) AC 0…575 V	AC 42 / 110 / 230 V	B 913 543
IRD1007L-5	AC / 3(N) AC 0…575 V	AC 42 / 110 / 230 V	B 913 574
IRD1007L-6	AC / 3(N) AC 0…575 V	AC 42 / 110 / 230 V	B 913 587
IRD1007L-7	AC / 3(N) AC 0…575 V	AC 42 / 110 / 230 V	B 913 050

Accessories

External kΩ measuring instrument

A-ISOMETER®	Type kΩ measuring instrument	Art. No kΩ measuring instrument
IRD1007L-3	9604-1321	B 986 796
IRD1007L-4	9604-1421	B 986 764
IRD1007L-5	9604-RB	B 986 792
IRD1007L-6	9604-1621	B 986 782

Coupling devices

Type	Nominal system voltage U_n	Art. No.
AGH204S-4	AC 0…1650 V / 0…1300 V	B 914 013
AGH520S	AC 0…7200 V	B 913 033

Technical data A-ISOMETER® IRD1007L…

Insulation coordination acc. to IEC 60664-1

Rated insulation voltage	AC 500 V
Rated impulse voltage / pollution degree	4 kV/3

Voltage ranges

Nominal system voltage U_n	AC, 3(N) AC 0…575 V
Nominal frequency f_n	40…460 Hz
Supply voltage U_S	AC 230 / 110 / 42 V
Operating range of U_S	0.8…1.15 x U_S
Frequency range U_S	40…460 Hz
Power consumption	≤ 3 VA

Response values

Response value R_{an1} (ALARM1)	see table "response values"
Response value R_{an2} (ALARM2)	see table "response values"
Response time t_{an} at R_F = 0.5 x R_{an} and C_e = 1 µF	Adjustable 0…10 s

Measuring circuit

Measuring voltage U_m	≤ 15 V
Measuring current I_m max. (at R_F = 0 Ω)	≤ 5.4 µA…536 µA
Internal d.c. resistance R_i	see table "response values"
Internal impedance Z_i at 50 Hz	> 1 MΩ
Max. admissible extraneous d.c. voltage U_{fg}	230 V (-3) / 500 V (-4) V
Max. system leakage capacitance C_e	1 µF

Outputs

TEST / RESET button	internal / external
Current output at measuring instrument (scale centre point = R_i)	400 µA
Max. load	12.5 kΩ

Switching elements

Switching elements	2 x 1 changeover contact
Operating principle	N/O / N/C operation
Factory setting	N/O operation
Electrical endurance	12000 cycles
Contact class	IIB acc. to DIN IEC 60255 part 0-20
Rated contact voltage	AC 250 V / DC 300 V
Making capacity	AC / DC 2 A
Breaking capacity	2 A, AC 230 V, cos phi = 0.4 0.2 A, DC 220 V, L/R = 0.04 s

General data

Shock resistance acc. to IEC 60068-2-27 (device in operation)	15 g / 6 ms
Bumping acc. to IEC 60068-2-29 (during transport)	40 g / 11 ms
Vibration resistance acc. to IEC 60068-2-6 (device in operation)	1 g / 10…150 Hz
Vibration resistance acc. to IEC 60068-2-6 (during transport)	2 g / 10…150 Hz
Ambient temperature, during operation	-10 °C…+60 °C
Storage temperature range	-40 °C…+80 °C
Climatic class according to IEC 60721-3-3	3K5
Operating mode	continuous operation
Mounting	any position
Connection	plug-in connectors E48; DIN 41612
Type of enclosure / dimension diagram	Eurocard 100 x 160 mm 8 TE, E48
Flammability class	UL94V-0
Instruction leaflet	104003
Weight approx.	300 g