**Product description**

The A-ISOMETER® of the IR423 series is designed to monitor the insulation resistance $R_F$ of an unearthed AC system of 0…300 V to earth that is supplied by a mobile generator according to IEC 60364-5-551/DIN VDE 0100-551 (VDE 0100-551). The IR423 is suitable for AC systems with operating frequencies $\geq 30$ Hz as well as for AC systems with directly connected DC circuits. The maximum permissible system leakage capacitance $C_{\text{max}}$ is 5 F.

**Application**

- IEC 60364-7-717: Electrical installations in mobile or transportable units.
- IEC 60364-5-551/DIN VDE 0100-551 (VDE 0100-551): Selection and erection of low voltage generating sets

**Function**

The currently measured insulation resistance is indicated on the LC display. In this way, any changes, for example, when loads are connected to the system, can be recognized easily. When the value falls below the preset response values, the response delay "$t_{\text{on}}$" starts. Once the response delay "$t_{\text{on}}$" has elapsed, the "K1/K2" alarm relays switch and the alarm LEDs "AL1/AL2" light up. Two separately adjustable response values/alarm relays allow a distinction to be made between prewarning and alarm. If the insulation resistance exceeds the release value (response value plus hysteresis), the alarm relays return to their initial position. If the fault memory is enabled, the alarm relays remain in the alarm state until the reset button is pressed or until the supply voltage is switched off.

The device function can be tested using the test button. The parameterization of the device can be carried out via the LC display or the function keys integrated in the front plate.

**Connection monitoring**

The connections to the system (L1 / L2) and earth (E / KE) are either automatically checked every 1 h, or by pressing the test button or when supply voltage is applied. In case of interruption of a connecting lead, the alarm relays K1 / K2 switch, the LEDs ON // AL1 // AL2 flash and the following message appears on the display:

- "E.02" indicating a fault in the connecting leads to the system,
- "E.01" indicating a fault in the connecting leads to PE.

After eliminating the fault, the alarm relays return to their initial position either automatically or by pressing the reset button.

**Measuring principle**

The A-ISOMETER® of the IR423 series uses the measuring principle "superimposed square-wave pulses".

**Device features**

- Insulation monitoring for mobile generators AC 0…300 V
- Protection by electrical separation with insulation monitoring and disconnection
- W version for protection against high mechanical stress
- Two separately adjustable response values
- Connection monitoring system/earth
- LEDs: Power On, Alarm 1, Alarm 2
- Internal/external test/reset button
- Two separate alarm relays (one changeover contact each)
- N/O or N/C operation, selectable
- Fault memory behaviour, selectable
- Self monitoring with automatic alarm message
- Multi-functional LC display
- Adjustable response delay
- Two-module enclosure (36 mm)

**Approvals**

- UL Listed
- CE Marked

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**A-ISOMETER® IR423**

**Insulation monitoring device for mobile generators**
1. Operating elements

1 - Power ON LED "ON", flashes in case of interruption of the connecting leads E/KE or L1 / L2.
2 - Alarm LED "AL1", lights when the value falls below the set response value Alarm 1 and flashes in case of interruption of the connecting leads E/KE or L1/L2.
3 - Alarm LED "AL2", lights when the value falls below the set response value Alarm 2 and flashes in case of interruption of the connecting leads E/KE or L1/L2.
4 - LC display
5 - Test button "T": to call up the self test.
   Arrow up key: Parameter change, to move up in the menu.
6 - Reset button "R": to delete stored insulation fault alarms
   Arrow down key: Parameter change, to move down in the menu.
7 - MENU key: to call up the menu system.
   Enter key: to confirm parameter change.

2. Wiring diagram

1 - Supply voltage U₅ (see ordering information) via fuse
2 - Separate connection of E, KE to PE
3 - Connection to the AC system to be monitored:
   AC: Connect terminals L1, L2 to the conductors L1, L2
4 - Alarm relay K1: Alarm 1
5 - Alarm relay K2: Alarm 2
6 - Combined test and reset button "T/R"
   short-time pressing (< 1.5 s) = RESET
   long-time pressing (> 1.5 s) = TEST
7 - Line protection by a fuse in accordance with IEC 60364-4-43 (6 A fuse recommended). In case of supply (A1/A2) from an IT system, both lines have to be protected by a fuse.
Examples of application

When mobile generators are used: protective measure "Protection by electrical separation with insulation monitoring and disconnection".

Setting of K1/K2 for overvoltage release:
N/O operation (n.o.) Fault memory setting: OFF

Setting of K1/K2 for contactor:
N/C operation (n.c.) Fault memory setting: ON

Dimension diagram XM420
Dimensions in mm
Open the front plate cover in direction of arrow!

Screw mounting
Note: The upper mounting clip must be ordered separately (see ordering information)!
Technical data A-ISOMETER® IR423

### Insulation coordination acc. to IEC 60664-1/IEC 60664-3
- **Rated insulation voltage**: 250 V
- **Rated impulse voltage/pollution degree**: 2.5 kV / III
- **Protective separation (reinforced insulation) between**: (A1, A2) - (L1, L2, E, KE, T/R) - (11, 12, 14) - (21, 22, 24)
- **Voltage test acc. to IEC 61010-1**: 2.21 kV

### Supply voltage
- **Supply voltage U_s**: see ordering information
- **Power consumption**: ≤ 3 VA

### IT system being monitored
- **Nominal system voltage U_n**: AC 0…300 V
- **Rated frequency f_n**: 30…460 Hz

### Response values
- **Response value R_a1 (Alarm 1)**: 1…200 kΩ (46 kΩ)*
- **Response value R_a2 (Alarm 2)**: 1…200 kΩ (23 kΩ)*
- **Operating error**: 1 kΩ…5 kΩ/5 kΩ…200 kΩ ± 0.5 kΩ/± 15%
- **Hysteresis**: 25% of the response value

### Specified time
- **Response time** t_a at R_f = 0.5 x R_a and C_e = 1 μF ≤ 1 s
- **Start-up delay** t_s: 0…10 s (0 s)*
- **Response delay** t_o: 0…99 s (0 s)*

### Measuring circuit
- **Measuring voltage** U_m: ± 12 V
- **Measuring current** I_a at R_t = 0 Ω: ≤ 200 μA
- **Internal DC resistance** R_i: ≥ 62 kΩ
- **Impedance** Z_e at 50 Hz: ≥ 60 kΩ
- **Permissible extraneous DC voltage** U_f: ≤ DC 300 V
- **Permissible system leakage capacitance** C_e: ≤ 5 μF

### Displays, memory
- **Display range, measuring value**: 1 kΩ…1 MΩ
- **Operating error**: 1 kΩ…5 kΩ/5 kΩ…1 MΩ ± 0.5 kΩ/± 15%
- **Password**: off / 0…999 (off)*
- **Fault memory (alarm relay)**: on/off*

### Outputs
- **Cable length test and reset button**: ≤ 10 m

### Switching elements
- **Number of switching elements**: 2 x 1 changeover contact
- **Operating principle**: N/C or N/O operation (N/O operation)*
- **Electrical service life, number of cycles**: 10,000
- **Contact data acc. to IEC 60947-5-1**
- **Utilization category**: AC-13 AC-14 DC-12 DC-12 DC-12
- **Rated operational voltage**: 230 V 230 V 220 V 110 V 24 V
- **Rated operational current**: 5 A 3 A 0.1 A 0.2 A 1 A
- **Minimum current**: 1 mA at AC/DC ≥ 10 V

### Environment/EMC
- **EMC**: IEC 61326-2-4
- **Operating temperature**: -40 °C…+ 70 °C
- **Climatic class acc. to IEC 60721**
- **Stationary use**: 3K5 (with condensation and formation of ice)
- **Transport**: 2K3 (except condensation and formation of ice)
- **Classification of mechanical conditions IEC 60721**
- **Stationary use**: 3M7
- **Transport**: 2M2
- **Long-time storage**: 1M3
- **Vibration resistance acc. to IEC 60068-2-6**
- for DIN rail mounting: 3 g / 30…150 Hz
- for screw mounting: 6 g / 30…150 Hz

### Connection
- **Connection**: screw-type terminals
- **rigid/flexible/conductor sizes**: 0.2…4/0.2…2.5 mm²/24-12 AWG
- **Multi-conductor connection (2 conductors with the same cross section)**: rigid/flexible: 0.2…1.5/0.2…1.5 mm²
- **Stripping length**: 8 … 9 mm
- **Tightening torque**: 0.5…0.6 Nm

### General data
- **Operating mode**: continuous operation
- **Mounting**: any position
- **Degree of protection, internal components (IEC 60529)**: IP30
- **Degree of protection, terminals (IEC 60529)**: IP20
- **Enclosure material**: polycarbonate
- **DIN rail mounting acc. to**: IEC 60715
- **Screw mounting**: 2 x M4 with mounting clip 2 x M4 with mounting clip
- **Operating manual**: BP101013
- **Weight**: ≤ 150 g

### Ordering information

<table>
<thead>
<tr>
<th>Type</th>
<th>Nominal system voltage* U_n</th>
<th>Supply voltage* U_s</th>
<th>Art. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IR423-D4-2W</td>
<td>AC 30…460 Hz 0…300 V</td>
<td>DC 70…300 V/AC 30…460 Hz 70…300 V</td>
<td>B 9101 6305W</td>
</tr>
<tr>
<td>IR423-D4-1W</td>
<td>AC 30…460 Hz 0…300 V</td>
<td>DC 9,6…94 V/AC 30…460 Hz 16…72 V</td>
<td>B 9101 6304W</td>
</tr>
</tbody>
</table>

* = factory setting

### Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Art. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting clip for screw mounting (one piece per device)</td>
<td>B 9806 0008</td>
</tr>
</tbody>
</table>