INSULATION MONITORING DEVICES

RI INSULATION MONITORING DEVICES
Continuous monitoring of IT systems from photovoltaic to industrial applications

HRI MEDICAL INSULATION MONITORING DEVICES
Technology and safety in hospital segment
To ensure the operational continuity of an electrical system, IEC 60364-4-41 Standard “Low-voltage electrical installations – Protection against electric shock” requires the system protection from direct and indirect contacts, according to the methods shown in the table. Among all the protection methods identified by the Standard, only IT distribution systems can guarantee greater operational continuity in case of a first fault to earth: in these systems, the circuit-breaker will not trip because the fault current is limited by the high insulation impedance. The IT distribution systems shall avoid the loss of production and ill service that power supply interruption could cause. The first fault to earth should be immediately recovered, because a second fault to earth would cause the tripping of the protection devices (miniature circuit-breakers or residual current circuit-breakers), interrupting the power supply. The Standard requires the installation of an insulation monitoring device to signal the first fault, in order to avoid a second fault that could compromise the required operational continuity. RI range performs continuous monitoring of IT systems insulation, in order to prevent any faults that may reduce operational continuity and, as a result, the efficiency of the system.

**OPERATIONAL CONTINUITY**
When installed in an IT network, the insulation monitoring device continuously controls insulation. In case of first fault, it gives warning about the first fault in order to recover it before the miniature circuit breakers interrupt the power supply.

**FAULT PREVENTION**
RI gives warning when insulation drops below a set value, preventing greater damages to the network.

**GREATER EFFICIENCY**
Thanks to TRIP and ALARM thresholds the fault can be managed even before it actually occurs, therefore preventing service interruption. In addition, the unit can be tested and reset remotely by means of a pushbutton.

**360° MONITORING**
RI range controls a wide variety of IT systems, providing protection to photovoltaic installations, industrial installations, supervision systems, data centers and other applications.

**CUTTING MAINTENANCE COSTS AND INEFFICIENCIES**
Thanks to a continuous and timely monitoring of the system, scheduled maintenance operations can be reduced together with overhead costs.

**IMMEDIATE INSTALLATION**
Quick fixing thanks to 35 mm DIN rail mounting. The front microswitches are preset on the most commonly used settings.
RI INSULATION MONITORING DEVICES

TECHNICAL FEATURES

AC/DC NETWORKS
RI-F48 | RI-R48 | RI-R48N
IT NETWORKS INSULATION CONTROL 24-48 VAC/DC

DC NETWORKS
RI-R11 | RI-R11D
IT NETWORKS INSULATION CONTROL 110-230 VCC

RI-R15
IT NETWORKS INSULATION CONTROL 600 VDC

AC NETWORKS
RI-F22 | RI-R22
IT NETWORKS INSULATION CONTROL 230 VAC

RI-R38
IT NETWORKS INSULATION CONTROL 440 VAC

RI-R44
IT NETWORKS INSULATION CONTROL 440 VAC, LCD DISPLAY, RS485

RI-R60
IT NETWORKS INSULATION CONTROL 760 VAC

VOLTAGE LESS NETWORKS
RI-SM
VOLTAGELESS NETWORK INSULATION CONTROL

RI-SM485
VOLTAGELESS NETWORK INSULATION CONTROL, RS485

ADAPTER
ARI-R15
IT NETWORKS INSULATION CONTROL 1000 VDC

ARI-R60
IT NETWORKS INSULATION CONTROL 1000 VAC

HRI MEDICAL INSULATION MONITORING DEVICES

HRI-R40
MEDICAL INSULATION MONITORING DEVICE

HRI-R24
MEDICAL INSULATION MONITORING DEVICES FOR SCIALITIC LAMPS

PR-5
REMOTE SIGNALLING PANEL

RMS-24
MULTIROOM MONITORING SYSTEM AND REMOTE MANAGEMENT
RI - INSULATION MONITORING DEVICES

RI range performs continuous of IT systems insulation, in order to prevent any faults that may reduce operational continuity and, as a result, the efficiency of the system.

Allows monitoring and protection in the most demanding application environments.

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<thead>
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<th>DC NETWORKS</th>
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<tr>
<td><strong>Controlled network voltage</strong></td>
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<td>24-48 VAC/DC</td>
<td>24-48 VAC/DC</td>
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<tr>
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<td>0.5 mA</td>
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<td>Max measuring voltage</td>
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<tr>
<td>TRIP Relay number NO-C-NC</td>
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<td>ALARM Relay number NO-C-NC</td>
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<td>Max relay contact capacity</td>
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<td>Max terminal section</td>
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<tr>
<td>Protection degree</td>
<td>IP40 on front</td>
<td>IP20 housing</td>
<td>IP40 on front</td>
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<tr>
<td>Insulation test</td>
<td>2.5 kV 60 sec</td>
<td>4 kV imp 1.2/50 μs</td>
<td>2.5 kV 60 sec</td>
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<tr>
<td>Modules</td>
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<td>Weight</td>
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<tr>
<td>Standards</td>
<td>EN 61010-1, EN 61557-8, EN 61326-1</td>
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</tr>
</tbody>
</table>
# TECHNICAL FEATURES

## PLANTY OF BENEFITS
- Operational Continuity
- Fault Prevention
- Greater Efficiency
- 360° Monitoring
- Cutting Maintenance Costs and Inefficiencies
- Immediate Installation

## APPLICATIONS
- Refineries
- Iron, Steel and Petrochemical Companies
- Photovoltaic Systems
- Data Centers, Movie Sets, TV or Radio Installations
- Fire-Fighting Pumps, Safety Circuits, UPS
- Elevator Control Systems
- Mobile Generators

## AC NETWORKS

<table>
<thead>
<tr>
<th>RI-F22</th>
<th>RI-R22</th>
<th>RI-R38</th>
<th>RI-R44</th>
<th>RI-R44-V-485</th>
<th>RI-R60</th>
<th>RI-SM</th>
<th>RI-SM-485</th>
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<tbody>
<tr>
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<td><img src="RI-R22.png" alt="Image" /></td>
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<td><img src="RI-R44.png" alt="Image" /></td>
<td><img src="RI-R44-V-485.png" alt="Image" /></td>
<td><img src="RI-R60.png" alt="Image" /></td>
<td><img src="RI-SM.png" alt="Image" /></td>
<td><img src="RI-SM-485.png" alt="Image" /></td>
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<td>230 VAC</td>
<td>230 VAC</td>
<td>440 VAC</td>
<td>440 VAC</td>
<td>500-760 VAC</td>
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<tr>
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<td>3 VA</td>
<td>3 VA</td>
<td>2 VA</td>
<td>5 VA</td>
<td>3 VA</td>
<td>2 VA</td>
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<td>-</td>
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<td>-</td>
<td>30-300 kΩ</td>
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<tr>
<td>100 kΩ</td>
<td>100 kΩ</td>
<td>10-150 kΩ</td>
<td>1-300 kΩ</td>
<td>10-100 kΩ</td>
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<td>&lt;5 sec</td>
<td>&lt;2.5 sec</td>
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<td>0.1 mA</td>
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<td>0.240 mA</td>
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<td>13 VAC</td>
<td>13 VAC</td>
<td>48 VAC</td>
<td>20 VDC</td>
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<td>250 kΩ</td>
<td>1500 kΩ dc</td>
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<td>1500 kΩ dc</td>
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<td>1000 kΩ ac</td>
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<td>4 mm²</td>
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<td>2.5 mm²</td>
<td>2.5 mm²</td>
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<td>200 g</td>
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## VOLTAGE LESS NETWORKS

<table>
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<th>VOLTAGE LESS NETWORKS</th>
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<tr>
<td>RI-44-V-485</td>
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<tr>
<td>250 V-5A</td>
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<tr>
<td>-</td>
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<tr>
<td>-10 ÷ 60 °C</td>
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<tr>
<td>-20 ÷ 80 °C</td>
</tr>
<tr>
<td>≤95%</td>
</tr>
<tr>
<td>4 mm²</td>
</tr>
<tr>
<td>3 kV 60 sec</td>
</tr>
<tr>
<td>4 kV imp 1.2/50 μs</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>200 g</td>
</tr>
</tbody>
</table>

EN 61010-1, EN 61557-8, EN 61326-1
RI-F48 | RI-R48 | RI-R48N

IT NETWORKS INSULATION CONTROL 24-48 VAC/DC

General Characteristics

These devices allows the insulation monitoring to earth of electric networks in alternate and direct current 24-48 VAC/DC isolated (IT systems). These devices measure the potential variation of two polarity on earth reference, to signal when the insulation decreasing under a fixed value. Auxiliary supply is taken from under-control network. On the frontal panel there is the signaling of device ON, a TEST and a RESET (versions RI-R48 and RI-R48N) pushbuttons and LEDs to the signaling of tripping (TRIP) and to indicate the polarity (version RI-R48N) of the line under control that has low insulation. The TRIP threshold is regulated by micro-switches (versions RI-R48 and RI-R48N). It’s available a changeover contact relay to use the low insulation signaling in a remote panel.

Technical characteristics

<table>
<thead>
<tr>
<th>Controlled network voltage</th>
<th>24-48 VAC/DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>3 VA</td>
</tr>
<tr>
<td>ALARM threshold setting</td>
<td>-</td>
</tr>
<tr>
<td>TRIP threshold setting</td>
<td>10÷60 kΩ (version RI-R48 and version RI-R48N)</td>
</tr>
<tr>
<td></td>
<td>100 kΩ (version RI-F48)</td>
</tr>
<tr>
<td>Tripping delay</td>
<td>&lt; 5 sec</td>
</tr>
<tr>
<td>Max measuring current</td>
<td>0.5 mA</td>
</tr>
<tr>
<td>Max measuring voltage</td>
<td>-</td>
</tr>
<tr>
<td>Internal impedance</td>
<td>50 kΩ</td>
</tr>
<tr>
<td>TRIP Relay number NO-C-NC</td>
<td>1</td>
</tr>
<tr>
<td>ALARM Relay number NO-C-NC</td>
<td>-</td>
</tr>
</tbody>
</table>

Max relay contact capacity | 250V - 5A
Operating temperature      | -10 – 60 °C
Storage temperature        | -20 – 80 °C
Relative humidity          | ≤95%
Max terminal section       | 4 mm²
Protection degree          | IP40 front | IP20 housing
Insulation test            | 2.5 kV 60 sec. / 4 kV imp 1.2/50 μs
Modules                     | 3
Weight                     | 200 g
Standards                  | EN 61010-1, EN 61557-8, EN 61326-1

ORDER CODE  | VERSION  | Vaux   | DESCRIPTION                                      | CONTROLLED NETWORK VOLTAGE | MODULES |
-------------|----------|--------|-------------------------------------------------|-----------------------------|---------|
RI-F48       | TRIP threshold fixed 100kΩ | 24-48 VAC/DC | IT networks insulation control 24-48 VAC/DC | 24-48 VAC/DC | 3       |
RI-R48       | TRIP threshold adjustment | 24-48 VAC/DC | IT networks insulation control 24-48 VAC/DC | 24-48 VAC/DC | 3       |
RI-R48N      | TRIP threshold adjustment | 24-48 VAC/DC | IT networks insulation control 24-48 VAC/DC | 24-48 VAC/DC | 3       |

Features

INSULATION MONITORING OF IT SYSTEMS 24-48 VAC/DC
TRIP MANUAL RESET (VERSIONS RI-R48 AND RI-R48N)
LOW INSULATION LED
DAMAGED POLE LED (VERSION RI-R48N)
TEST PUSHBUTTON
TRIP THRESHOLD SETTING (VERSIONS RI-R48 AND RI-R48N)
# Operators

**RI-F48**

- **3** TEST
- **4** TRIP ON
- **5** TRIP LED

**RI-R48**

- **3** TEST
- **4** TRIP ON
- **5** TRIP LED

**RI-R48N**

- **3** TEST
- **4** TRIP ON
- **5** TRIP LED

---

## Wiring diagrams

**RI-F48**

- **V max**
- **V control**
- **PE**
- **LOAD**

**RI-R48**

- **V max**
- **V control**
- **PE**
- **LOAD**

**RI-R48N**

- **V max**
- **V control**
- **PE**
- **LOAD**

---

## Mechanical dimensions (mm)

- **RI-F48**
  - Height: 85
  - Width: 52.5

- **RI-R48**
  - Height: 85
  - Width: 64

- **RI-R48N**
  - Height: 85
  - Width: 68
The RI-R11-115 and RI-R11-230 devices allow the permanent insulation monitoring to earth of electric networks in direct current isolated (IT systems).

Insulation resistance monitoring is carried out measuring the potential variation of two polarity on ground reference. Auxiliary supply is taken from under-control network. The threshold of trip is regulated by a series of micro-switches.

On the frontal panel there is the signaling of device ON, a TEST and a RESET push-buttons and three red LED to signal the tripping (TRIP) and to indicate the polarity of the line under control that has low insulation. It’s available a changeover contact relay to use the low insulation signaling in a remote panel.

### Features

- **INSULATION MONITORING OF IT SYSTEMS UP TO 230 VDC**
- **TRIP AND ALARM LED**
- **INSULATION LEVEL**
- **DAMAGED POLE LED**
- **TRIP AND ALARM THRESHOLD SETTING**
- **TEST AND RESET PUSHBUTTON**

### Technical characteristics

<table>
<thead>
<tr>
<th>Controlled network voltage</th>
<th>Power consumption</th>
<th>ALARM threshold setting</th>
<th>TRIP threshold setting</th>
<th>Tripping delay</th>
<th>Max measuring current</th>
<th>Max measuring voltage</th>
<th>Internal impedance</th>
<th>TRIP Relay number NO-C-NC</th>
<th>ALARM Relay number NO-C-NC</th>
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<tr>
<td>100-144 VDC (version RI-R11 115) 230 VDC (version RI-R11 230)</td>
<td>4 VA</td>
<td>30÷300 Ω</td>
<td>10÷100 Ω</td>
<td>&lt; 5 sec</td>
<td>1.8 mA</td>
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<td>100 kΩ L/PE</td>
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### Standards

EN 61010-1, EN 61557-8, EN 61326-1

### Module specifications

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<th>Vaux</th>
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<th>CONTROLLED NETWORK VOLTAGE</th>
<th>MODULES</th>
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<tr>
<td>RI-R11 115</td>
<td>ALARM and TRIP threshold setting Damaged pole LED</td>
<td>80-180 VDC</td>
<td>IT networks insulation control 115 VDC</td>
<td>100-144 VDC</td>
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<tr>
<td>RI-R11D 115</td>
<td>ALARM and TRIP threshold setting, damaged pole LED, insulation level display</td>
<td>80-180 VDC</td>
<td>IT networks insulation control 115 VDC</td>
<td>100-144 VDC</td>
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<tr>
<td>RI-R11 230</td>
<td>ALARM and TRIP threshold setting Damaged pole LED</td>
<td>185-275 VDC</td>
<td>IT networks insulation control 230 VDC</td>
<td>230 VDC</td>
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<tr>
<td>RI-R11D 230</td>
<td>ALARM and TRIP threshold setting, damaged pole LED, insulation level display</td>
<td>185-275 VDC</td>
<td>IT networks insulation control 230 VDC</td>
<td>230 VDC</td>
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</table>
RI-R11 | RI-R11D

IT NETWORKS INSULATION CONTROL 110-230 VCC

---

**Operators**

- **Indication of functioning instrument**
- **Test pushbutton**
- **Reset pushbutton**
- **Alarm threshold settings**

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**Wiring diagrams**

- **Vaux**
- **V control**
- **Test**
- **Reset**

---

**Mechanical dimensions (mm)**

- **Dimensions:**
  - Width: 105 mm
  - Depth: 68 mm
RI-R15
IT NETWORKS INSULATION CONTROL 600 VDC

The RI-R15 device allows the permanent insulation monitoring to earth of electric networks in direct current isolated (IT systems). Insulation resistance monitoring is carried out measuring the potential variation of two polarity on ground reference. Auxiliary supply is taken from under-control network.

The threshold of trip is regulated by a frontal potentiometer. On the frontal panel there is the signaling of device ON, and three red LED to signal the tripping (TRIP) and to indicate the polarity of the line under control that has low insulation. It’s available a changeover contact relay to use the low insulation signaling in a remote panel. The relay can be set as FAIL SAFE function. On front panel there are a TEST and a RESET push-buttons.

The test can be activated locally while the reset can be set in automatic or manual, with local or external push-button.

### Features

**INSULATION MONITORING OF IT SYSTEMS UP TO 600 VDC**

**WIDE TRIPPING THRESHOLD ADJUSTMENT**

**FAIL SAFE RELAY FOR TIMELY MONITORING, EVEN IN CASE OF SUPPLY FAILURE**

**TEST AND RESET CAN BE REMOTELY OPERATED BY A PUSHBUTTON**

**VISUAL INDICATION OF THE NETWORK STATUS AND INDICATION OF THE FAULTY POLARITY**

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### General Characteristics

- **Controlled network voltage**: 280-340 VDC (version RI-R15 300), 400-600 VDC (version RI-R15 500, 600-1000 VDC (with ARI-R15 adapter)
- **Power consumption**: 6 VA
- **TRIP threshold setting**: 30÷300 kΩ
- **Tripping delay**: < 5 sec
- **Max measuring current**: 1.5 mA
- **Max measuring voltage**: -
- **Internal impedance**: 450 kΩ L/PE
- **TRIP Relay number NO-C-NC**: 1
- **ALARM Relay number NO-C-NC**: -
- **Max relay contact capacity**: 250V - 5A
- **Operating temperature**: -10 – 60 °C
- **Storage temperature**: -20 – 80 °C
- **Relative humidity**: ≤ 95%
- **Max terminal section**: 2.5 mm²
- **Protection degree**: IP40 front | IP20 housing
- **Insulation test**: 2.5 kV 60 sec. / 4 kV imp 1.2/50 μs
- **Modules**: 6
- **Weight**: 400 g
- **Standards**: EN 61010-1, EN 61557-8, EN 61326-1

### Technical characteristics

<table>
<thead>
<tr>
<th>ORDER CODE</th>
<th>VERSION</th>
<th>Vaux</th>
<th>DESCRIPTION</th>
<th>CONTROLLED NETWORK VOLTAGE</th>
<th>MODULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI-R15 300</td>
<td>TRIP threshold adjustment, damaged pole LED</td>
<td>280-340 VDC</td>
<td>IT networks insulation control 340 VDC</td>
<td>280-340 VDC</td>
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<tr>
<td>RI-R15 500</td>
<td>TRIP threshold adjustment, damaged pole LED</td>
<td>400-600 VDC</td>
<td>IT networks insulation control 600 VDC</td>
<td>400-600 VDC</td>
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<tr>
<td>RI-R15 1000</td>
<td>TRIP threshold adjustment, damaged pole LED</td>
<td>600-1000 VDC</td>
<td>IT networks insulation control 1000 VDC (with ARI-R15 adapter)</td>
<td>600-1000 VDC</td>
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</tr>
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RI-R15
IT NETWORKS INSULATION CONTROL 600 VDC

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### Operators

- **Damaged Pole LED**
- **Trip Threshold Adjustment**
- **Trip LED**

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### Wiring diagrams

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### Mechanical dimensions (mm)
**General Characteristics**

- **Features**
  - INSULATION MONITORING UP TO 230 VAC
  - RESET PUSHBUTTON (ONLY FOR RI-R22)
  - INDICATION OF FUNCTIONING INSTRUMENT
  - LOW INSULATION LED
  - TEST PUSHBUTTON
  - TRIP THRESHOLD SETTING (ONLY FOR RI-R22)

- **Technical characteristics**

<table>
<thead>
<tr>
<th>Controlled network voltage</th>
<th>230 VAC</th>
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</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>3 VA</td>
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<tr>
<td>TRIP threshold setting</td>
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</tr>
<tr>
<td>Tripping delay</td>
<td>&lt; 5 sec</td>
</tr>
<tr>
<td>Max measuring current</td>
<td>0.1 mA</td>
</tr>
<tr>
<td>Max measuring voltage</td>
<td>12 VDC</td>
</tr>
<tr>
<td>Internal impedance</td>
<td>250 kΩ</td>
</tr>
<tr>
<td>TRIP Relay number NO-C-NC</td>
<td>1</td>
</tr>
<tr>
<td>ALARM Relay number NO-C-NC</td>
<td>-</td>
</tr>
</tbody>
</table>

These devices allow the insulation monitoring to earth of electric networks in alternate current up to 230 VAC isolated (IT systems). Insulation resistance monitoring is carried out applying a measure’s signaling in direct-current between isolated network and heart. Surveying electric leakage set up on earth it’s possible to measure insulation level. It’s available a changeover contact relay to use the low insulation signaling in a remote panel. On frontal panel, devices have signal for activity ON, for TRIP (low insulation), a test button. The TRIP threshold is fixed to 100 kΩ (version RI-F22), or can be regulate by a frontal potentiometer (version RI-R22).

<table>
<thead>
<tr>
<th>ORDER CODE</th>
<th>VERSION</th>
<th>VAUX</th>
<th>DESCRIPTION</th>
<th>CONTROLLED NETWORK VOLTAGE</th>
<th>MODULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI-F22 115</td>
<td>ALARM and TRIP threshold setting, damaged pole LED, insulation level display</td>
<td>115 VAC</td>
<td>IT networks insulation control 230 VAC</td>
<td>220-240 VAC</td>
<td>3</td>
</tr>
<tr>
<td>RI-F22 230</td>
<td>ALARM and TRIP threshold setting, damaged pole LED, insulation level display</td>
<td>230 VAC</td>
<td>IT networks insulation control 230 VAC</td>
<td>220-240 VAC</td>
<td>3</td>
</tr>
<tr>
<td>RI-R22 24</td>
<td>ALARM and TRIP threshold setting, damaged pole LED</td>
<td>24 VDC</td>
<td>IT networks insulation control 230 VAC</td>
<td>220-240 VAC</td>
<td>3</td>
</tr>
<tr>
<td>RI-R22 115</td>
<td>ALARM and TRIP threshold setting, damaged pole LED, insulation level display</td>
<td>115 VAC</td>
<td>IT networks insulation control 230 VAC</td>
<td>220-240 VAC</td>
<td>3</td>
</tr>
<tr>
<td>RI-R22 230</td>
<td>ALARM and TRIP threshold setting, damaged pole LED, insulation level display</td>
<td>230 VAC</td>
<td>IT networks insulation control 230 VAC</td>
<td>220-240 VAC</td>
<td>3</td>
</tr>
<tr>
<td>RI-R22 1000</td>
<td>ALARM and TRIP threshold setting, damaged pole LED, insulation level display</td>
<td>115 or 230 VCA</td>
<td>IT networks insulation control 1000 VAC (with ADAPTER)</td>
<td>max 1000 VAC</td>
<td>3</td>
</tr>
</tbody>
</table>

Max relay contact capacity: 250V - 5A
Operating temperature: -10 ÷ 60 °C
Storage temperature: -20 ÷ 80 °C
Relative humidity: ≤ 95%
Max terminal section: 4 mm²
Protection degree: IP40 front | IP20 housing
Insulation test: 2.5 kV 60 sec | 4 kV imp 1.2/50 μs
Modules: 3
Weight: 200 g
Standards: EN 61010-1, EN 61557-8, EN 61326-1
**RI-F22 | RI-R22**

**IT NETWORKS INSULATION CONTROL 230 VAC**

---

**Operators**

- **TEST PUSHBUTTON**
- **TRIP LED**
- **INDICATION OF FUNCTIONING INSTRUMENT**

---

**Wiring diagrams**

---

**Mechanical dimensions (mm)**
The RI-R38 is a device that allows to control the insulation to earth in alternating neutral networks up to 440 VAC (IT systems).

Putting a continuous component measure signal between the insulated line and earth it’s possible to control the insulation resistance reading the dispersion current generated to earth.

On the frontal panel of RI-R38 there is the signaling of device ON, the signaling of tripping TRIP (low insulation), a test and a reset push-buttons and a series of micro-switches to regulated the threshold of trip.

It’s available a changeover contact relay to use the low insulation signaling in a remote panel.

## Features

**INSULATION MONITORING UP TO 440 VAC**

**RESET PUSHBUTTON**

**INDICATION OF FUNCTIONING INSTRUMENT**

**LOW INSULATION LED**

**TEST PUSHBUTTON**

**TRIP THRESHOLD SETTING**

### General Characteristics

![RI-R38](image)

**RI-R38**

**IT NETWORKS INSULATION CONTROL 440 VAC**

### Technical characteristics

<table>
<thead>
<tr>
<th>Controlled network voltage</th>
<th>380-415 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>3 VA</td>
</tr>
<tr>
<td>ALARM threshold setting</td>
<td>-</td>
</tr>
<tr>
<td>TRIP threshold setting</td>
<td>10÷150 kΩ</td>
</tr>
<tr>
<td>Tripping delay</td>
<td>&lt; 5 sec</td>
</tr>
<tr>
<td>Max measuring current</td>
<td>0.1 mA</td>
</tr>
<tr>
<td>Max measuring voltage</td>
<td>12 Vdc</td>
</tr>
<tr>
<td>Internal impedance</td>
<td>250 kΩ</td>
</tr>
<tr>
<td>TRIP Relay number NO-C-NC</td>
<td>1</td>
</tr>
<tr>
<td>ALARM Relay number NO-C-NC</td>
<td>-</td>
</tr>
</tbody>
</table>

Max relay contact capacity 250V - 5A

Operating temperature: -10 – 60 °C

Storage temperature: -20 – 80 °C

Relative humidity ≤ 95%

Max terminal section 4 mm²

Protection degree: IP40 front | IP20 housing

Insulation test: 2.5 kV 60 sec | 4 kV imp 1.2/50 μs

Modules 3

Weight 200 g

Standards: EN 61010-1, EN 61557-8, EN 61326-1

### ORDER CODE

<table>
<thead>
<tr>
<th>ORDER CODE</th>
<th>VERSION</th>
<th>Vaux</th>
<th>DESCRIPTION</th>
<th>CONTROLLED NETWORK VOLAGE</th>
<th>MODULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI-R38 115</td>
<td>TRIP threshold adjustment</td>
<td>115 VAC</td>
<td>IT networks insulation control 440 VAC</td>
<td>380-415 VAC</td>
<td>3</td>
</tr>
<tr>
<td>RI-R38 230</td>
<td>TRIP threshold adjustment</td>
<td>230 VAC</td>
<td>IT networks insulation control 440 VAC</td>
<td>380-415 VAC</td>
<td>3</td>
</tr>
<tr>
<td>RI-R38 1000</td>
<td>TRIP threshold adjustment</td>
<td>115 or 230 VCA</td>
<td>IT networks insulation control 1000 VAC (with ADAPTER)</td>
<td>max 1000 VCA</td>
<td>3</td>
</tr>
</tbody>
</table>

### Controls

- **RI-R38 115**: TRIP threshold adjustment
- **RI-R38 230**: TRIP threshold adjustment
- **RI-R38 1000**: TRIP threshold adjustment
### RI-R38

**IT NETWORKS INSULATION CONTROL 440 VAC**

---

**Operators**

- **TRIP THRESHOLD SETTING**
- **TEST PUSHBUTTON**

---

**Wiring diagrams**

*In case of non-accessible neutral, connect terminal 5 to the L3*

---

**Mechanical dimensions (mm)**

- Width: 85 mm
- Depth: 52.5 mm
- Height: 64 mm
- 68 mm

---
**RI-R44**

IT NETWORKS INSULATION CONTROL 440 VAC

LCD DISPLAY, RS485

---

### General Characteristics

RI-R44 is a device that allows the insulation monitoring to earth of AC networks up to 440V isolated (IT systems). By applying a DC component measure signal between the insulated line and earth it’s possible to control the insulation resistance by detecting the generated leakage current.

Thanks to the LCD display, the device allows the visualization of the instantaneous insulation value. Configurable automatic or manual resetting. It has a TRIP changeover contact configurable normally de-energised or energised.

The RI-R44 is also provided with a RS-485 interface with Modbus protocol to consent the integration in supervision systems.

---

### Features

- **INSULATION MONITORING OF IT SYSTEMS UP TO 440 VAC**
- **LCD DISPLAY** (Alarm or prealarm indicating events)
- **LOW INSULATION LED**
- **CONFIGURABLE AUTOMATIC OR MANUAL_RESETTING**
- **TEST PUSHBUTTON**
- **TRIP THRESHOLD SETTING**
- **TRIP OUTPUT RELAY**
- **RS485 SERIAL INTERFACE** (MODBUS RTU)

---

### Technical Characteristics

<table>
<thead>
<tr>
<th>Controlled network voltage</th>
<th>440 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>2 VA</td>
</tr>
<tr>
<td>ALARM threshold setting</td>
<td>-</td>
</tr>
<tr>
<td>TRIP threshold setting</td>
<td>1–300 kΩ</td>
</tr>
<tr>
<td>Tripping delay</td>
<td>&lt; 2.5 sec</td>
</tr>
<tr>
<td>Max measuring current</td>
<td>0.015 mA</td>
</tr>
<tr>
<td>Max measuring voltage</td>
<td>13 VDC</td>
</tr>
<tr>
<td>Internal impedance</td>
<td>1.5 MΩ for DC</td>
</tr>
<tr>
<td>TRIP Relay number NO-C-NC</td>
<td>1</td>
</tr>
<tr>
<td>ALARM Relay number NO-C-NC</td>
<td>-</td>
</tr>
</tbody>
</table>

- **Max relay contact capacity** 250V - 5A
- **Operating temperature** -10 – 60 °C
- **Storage temperature** -20 – 80 °C
- **Relative humidity** ≤ 95%
- **Max terminal section** 2.5 mm²
- **Protection degree** IP40 front | IP20 housing
- **Insulation test** 2.5 kV 60 sec | 4 kV imp 1.2/50 μs
- **Modules** 2
- **Weight** 200 g
- **Standards** EN 61010-1, EN 61557-8, EN 61326-1

---

### ORDER CODE

<table>
<thead>
<tr>
<th>ORDER CODE</th>
<th>VERSION</th>
<th>VAux</th>
<th>DESCRIPTION</th>
<th>CONTROLLED NETWORK VOLTAGE</th>
<th>MODULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI-R44</td>
<td>TRIP threshold adjustment</td>
<td>230 VAC</td>
<td>IT networks insulation control 440 VAC</td>
<td>440 VAC</td>
<td>2</td>
</tr>
<tr>
<td>RI-R44-485</td>
<td>TRIP threshold adjustment, RS845 serial interface</td>
<td>230 VAC</td>
<td>IT networks insulation control 440 VAC</td>
<td>440 VAC</td>
<td>2</td>
</tr>
<tr>
<td>RI-R44-V</td>
<td>TRIP threshold adjustment, LCD display</td>
<td>230 VAC</td>
<td>IT networks insulation control 440 VAC</td>
<td>440 VAC</td>
<td>2</td>
</tr>
<tr>
<td>RI-R44-V-485</td>
<td>TRIP threshold adjustment, LCD display, RS845 serial interface</td>
<td>230 VAC</td>
<td>IT networks insulation control 440 VAC</td>
<td>440 VAC</td>
<td>2</td>
</tr>
</tbody>
</table>

---

**Instantaneous display**

LCD display that enables quick alarm viewing of the insulation value. Incorporates illuminated status change for instantaneous detection of the status of the installation.
RI-R44

IT NETWORKS INSULATION CONTROL 440 VAC
LCD DISPLAY, RS485

---

**Operators**

- TRIP THRESHOLD SETTING
- FAIL SAFE SETTING
- AUTO-RESET
- MAX RESET
- DELAY SETTING
- RS485 SERIAL SPEED SETTING
- RS485 SERIAL NODE ADDRESS SETTING

---

**Wiring diagrams**

- **Vaux**
- **RS485**
- **LOAD**

---

**Mechanical dimensions (mm)**

- Width: 92.2, Height: 73, Depth: 49.5
- Width: 92.2, Height: 54.3, Depth: 45
- Width: 92.2, Height: 54.3, Depth: 45
- Width: 92.2, Height: 54.3, Depth: 45
RI-R60 is a device that allows to control the insulation to earth in alternating neutral networks up to 760 V (IT systems).

Putting a continuous component measure signal between the insulated line and earth it’s possible to control the insulation resistance reading the dispersion current generated to earth.

These devices have two trip thresholds (ALARM and TRIP) adjustable using the frontal micro-switches to signal when the insulation go under the threshold level. The frontal LED signaling the trip. Two free voltage changeover contacts relays allow the remote trip signaling. The relays can be programmed with the fail safe (normally excited).

The device is supplied on the front panel of a TEST and a RESET push-buttons. The test can be activated thanks to the push-button on the device or to external push-button while the reset that can be set in manual or in automatic and activated, as the test, with the local or remote push-button.

The level of the insulation resistance is displayed on the bar LED on the front panel.

---

**General Characteristics**

**Features**

- INSULATION MONITORING UP TO 1000 VAC
- DOUBLE MONITORING THRESHOLD FOR MORE EFFECTIVE FAULT PREVENTION
- FAIL SAFE DOUBLE RELAY FOR EFFECTIVE SYSTEM CONTROL AND TIMELY MONITORING, EVEN IN CASE OF SUPPLY FAILURE

---

**Technical characteristics**

<table>
<thead>
<tr>
<th>Controlled network voltage</th>
<th>500-760 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>5</td>
</tr>
<tr>
<td>ALARM threshold setting</td>
<td>30÷300 kΩ</td>
</tr>
<tr>
<td>TRIP threshold setting</td>
<td>10÷100 kΩ</td>
</tr>
<tr>
<td>Tripping delay</td>
<td>&lt; 5 sec</td>
</tr>
<tr>
<td>Max measuring current</td>
<td>0.240 mA</td>
</tr>
<tr>
<td>Max measuring voltage</td>
<td>48 VDC</td>
</tr>
<tr>
<td>Internal impedance</td>
<td>200 kΩ</td>
</tr>
<tr>
<td>TRIP Relay number NO-C-NC</td>
<td>1</td>
</tr>
<tr>
<td>ALARM Relay number NO-C-NC</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max relay contact capacity</th>
<th>250V - 5A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>-10 – 60 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20 – 80 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95%</td>
</tr>
<tr>
<td>Max terminal section</td>
<td>2.5 mm²</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP40 front</td>
</tr>
<tr>
<td>Insulation test</td>
<td>3 kV 60 sec. / 4 kV imp 1.2/50 μs</td>
</tr>
<tr>
<td>Modules</td>
<td>6</td>
</tr>
<tr>
<td>Weight</td>
<td>500 g</td>
</tr>
<tr>
<td>Standards</td>
<td>EN 61010-1, EN 61557-8, EN 61326-1</td>
</tr>
</tbody>
</table>

---

**ORDER CODE**

- **RI-R60**
  - ALARM and TRIP threshold setting, insulation level display
  - 110-230 VAC
  - IT networks insulation control up to 780 VAC
  - 500-760 VAC
  - 6 modules

- **RI-R60 1000**
  - ALARM and TRIP threshold setting, insulation level display
  - 110-230 VAC
  - IT networks insulation control up to 1000 VAC (with ARI-R60 adapter)
  - 1000 VAC
  - 6 modules
**RI-R60**

**IT NETWORKS INSULATION CONTROL 760 VAC**

---

**Operators**

- **Test Pushbutton**
- **Reset Pushbutton**
- **Alarm Threshold Settings**
- **Trip Threshold Setting**

---

**Wiring diagrams**

*In case of non-accessible neutral, connect terminal 22 to the L1

---

**Mechanical dimensions (mm)**

*Max 230 V L-N
The RI-SM allows insulation monitoring to earth of out-voltage networks. This device must carry-out a preventive check of the insulation level for out-voltage devices, not used permanently, in the way to avoid damage when they start to function (ex. fire-engines, lift, etc.). Insulation resistance’s monitoring is carried out applying a measure’s signaling in direct current component between out-voltage isolated network and earth. Surveying leakage current to earth it’s possible to measure the insulation’s level.

The RI-SM is useful for networks and devices from 20 to 700 VAC/DC. A changeover contact relay is available to signal the low insulation to a remote panel.

On front panel there is the signaling of device ON, the signaling of TRIP for low insulation, the TEST push-button and the micro-switches to select the tripping threshold and FAIL SAFE function.

The RESET of the device is automatic when the condition of low insulation disappears.

The device must be connected to the network to survey using a normally closet contact in the way to disconnect from the network when it’s turning on.

The output relay can be used to signal the alarm or to avoid the insertion of the load.

### General Characteristics

**Features**

- **Indication of Functioning Instrument**
- **Test Pushbutton**
- **Low Insulation LED**
- **Fail Safe Setting**
- **Trip Threshold Setting**

### Technical Characteristics

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Power consumption</td>
<td>3 VA</td>
</tr>
<tr>
<td>Alarm threshold setting</td>
<td>-</td>
</tr>
<tr>
<td>Trip threshold setting</td>
<td>0.1–1000 kΩ</td>
</tr>
<tr>
<td>Tripping delay</td>
<td>&lt; 5 sec</td>
</tr>
<tr>
<td>Max measuring current</td>
<td>0.015 mA</td>
</tr>
<tr>
<td>Max measuring voltage</td>
<td>20 VDC</td>
</tr>
<tr>
<td>Internal impedance</td>
<td>1.5 MΩ DC</td>
</tr>
<tr>
<td>Trip Relay number NO-C-NC</td>
<td>1</td>
</tr>
<tr>
<td>Alarm Relay number NO-C-NC</td>
<td>-</td>
</tr>
<tr>
<td>Max relay contact capacity</td>
<td>250V - 5A</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-10 – 60 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20 – 80 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95%</td>
</tr>
<tr>
<td>Max terminal section</td>
<td>4 mm²</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP40 front</td>
</tr>
<tr>
<td>Insulation test</td>
<td>2.5 kV 60 sec</td>
</tr>
<tr>
<td>Modules</td>
<td>3</td>
</tr>
<tr>
<td>Weight</td>
<td>200 g</td>
</tr>
<tr>
<td>Standards</td>
<td>EN 61010-1, EN 61557-8, EN 61326-1</td>
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### Order Code

<table>
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<th>Order Code</th>
<th>Version</th>
<th>Vaux</th>
<th>Description</th>
<th>Modules</th>
</tr>
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<tbody>
<tr>
<td>RI-SM 24</td>
<td>TRIP threshold setting, FAIL SAFE setting</td>
<td>24 VDC</td>
<td>Voltageless networks insulation control</td>
<td>3</td>
</tr>
<tr>
<td>RI-SM 115</td>
<td>TRIP threshold setting, FAIL SAFE setting</td>
<td>115 VAC</td>
<td>Voltageless networks insulation control</td>
<td>3</td>
</tr>
<tr>
<td>RI-SM 230</td>
<td>TRIP threshold setting, FAIL SAFE setting</td>
<td>230 VAC</td>
<td>Voltageless networks insulation control</td>
<td>3</td>
</tr>
</tbody>
</table>
RI-SM

VOLTAGELESS NETWORK INSULATION CONTROL

Operators

- Indication of functioning instrument
- Trip threshold setting
- Test pushbutton

Wiring diagrams

- In case of non-accessible neutral, connect terminal 5 to the L3

Mechanical dimensions (mm)

- Operators
- Wiring diagrams
- Mechanical dimensions
The devices allow insulation monitoring to earth of out-voltage networks in order to carry out a preventive monitoring on insulation level of device. Preventive monitoring is really important in case of applications which are not used permanently (for example: motors, fire-engines, and so on). In these applications, humidity and condensate can cause a serious decrease in insulation’s level and obstruct correct functioning at the moment of application’s activation. Insulation resistance’s monitoring is carried out applying a measure’s signaling in direct-current component between isolated network and earth. Surveying leakage current to earth it’s possible to measure insulation’s level. A very compact housing allows you to place the RI-SM485 in small spaces, optimizing the layout of the installation. The RI-SM485 is also provided with a RS-485 interface with Modbus protocol to consent the integration in supervision systems.

### General Characteristics

![Image of the RI-SM485 device]

The devices allow insulation monitoring to earth of out-voltage networks in order to carry out a preventive monitoring on insulation level of device. Preventive monitoring is really important in case of applications which are not used permanently (for example: motors, fire-engines, and so on). In these applications, humidity and condensate can cause a serious decrease in insulation’s level and obstruct correct functioning at the moment of application’s activation. Insulation resistance’s monitoring is carried out applying a measure’s signaling in direct-current component between isolated network and earth. Surveying leakage current to earth it’s possible to measure insulation’s level. A very compact housing allows you to place the RI-SM485 in small spaces, optimizing the layout of the installation. The RI-SM485 is also provided with a RS-485 interface with Modbus protocol to consent the integration in supervision systems.

### Features

- **INDICATION OF FUNCTIONING INSTRUMENT**
- **TEST PUSHBUTTON**
- **LOW INSULATION LED**
- **FAIL SAFE SETTING**
- **TRIP THRESHOLD SETTING**
- **OUTPUT RELAY**
- **RS485 SERIAL INTERFACE (MODBUS RTU)**

### Technical characteristics

<table>
<thead>
<tr>
<th>Power consumption</th>
<th>2 VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALARM threshold setting</td>
<td>-</td>
</tr>
<tr>
<td>TRIP threshold setting</td>
<td>0.1÷1500 kΩ</td>
</tr>
<tr>
<td>Tripping delay</td>
<td>&lt; 2.5 sec</td>
</tr>
<tr>
<td>Max measuring current</td>
<td>0.015 mA</td>
</tr>
<tr>
<td>Max measuring voltage</td>
<td>13 VDC</td>
</tr>
<tr>
<td>Internal impedance</td>
<td>1.5 MΩ DC</td>
</tr>
<tr>
<td>TRIP Relay number NO-C-NC</td>
<td>1</td>
</tr>
<tr>
<td>ALARM Relay number NO-C-NC</td>
<td>-</td>
</tr>
<tr>
<td>Max relay contact capacity</td>
<td>250V – 5A</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-10 – 60 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20 – 80 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>≤ 95%</td>
</tr>
<tr>
<td>Max terminal section</td>
<td>2.5 mm²</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP40 front</td>
</tr>
<tr>
<td>Insulation test</td>
<td>2.5 kV 60 sec</td>
</tr>
<tr>
<td>Modules</td>
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<tr>
<td>Weight</td>
<td>200 g</td>
</tr>
<tr>
<td>Standards</td>
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### Table: ORDER CODE, VERSION, VAUX, DESCRIPTION, MODULES

<table>
<thead>
<tr>
<th>ORDER CODE</th>
<th>VERSION</th>
<th>VAUX</th>
<th>DESCRIPTION</th>
<th>MODULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI-SM-485</td>
<td>TRIP threshold setting, FAIL SAFE setting, RS485 serial interface</td>
<td>230 VAC</td>
<td>Voltageless networks insulation control</td>
<td>2</td>
</tr>
</tbody>
</table>

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**RI-SM485**  
**VOLTAGELESS NETWORKS INSULATION CONTROL, RS485**
**Operators**

- **Trip Threshold Setting**
- **Fail Safe Setting**
- **Auto-Reset / Manual Reset**
- **RS485 Serial Speed Setting**
- **RS485 Serial Node Address Setting**

**Indication of Functioning Instrument**
- **Trip LED**
- **Alarm LED**
- **Test Pushbutton**
- **Reset Pushbutton**

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**Wiring diagrams**

- Voltage less Networks Insulation Control, RS485
- Load output relay:
  - NO
  - COM
  - NC
  - PE

- **Mechanical dimensions (mm)**
  - Width: 90
  - Height: 263
  - Thickness: 48
ARI-R15 ALLOWS INSULATION MONITORING UP TO 1000 VDC.

THE EXTERNAL ADAPTER ARI-R15 MUST BE USED ONLY WITH RI-R15 1000.

THIS ADAPTER MUST BE POSITIONED BETWEEN THE NETWORK TO CONTROL AND THE DEVICE RI-R15 1000.
General Characteristics

ARI-R60 allows insulation monitoring up to 1000 VAC.

The external adapter ARI-R60 must be used only with RI-R60. This adapter must be positioned between the network to control and the device RI-R60.

Mechanical dimensions (mm)

Wiring diagrams

In case of non-accessible neutral, connect terminal 22 to the L1 phase conductor.