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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 18216.11-2024

**Electrical safety in low voltage distribution systems up to 1 000 V AC and 1 500 V
DC - Equipment for testing, measuring or monitoring of protective measures -
Part 11: Effectiveness of residual current monitors(RCM)in TT, TN and IT systems
(English Translation)**

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Figure 1 Maximum step size of increasing smooth DC test current (IT)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting is required.

This document is a supplement to GB/T 18216 "Electrical safety protection measures for low voltage power distribution systems with AC 1 000 V and DC 1 500 V and below" Part 11 of "Test, Measuring or Monitoring Equipment". GB/T 18216 has published the following parts.

- Part 1: General requirements;
- Part 2: Insulation resistance;
- Part 3: Loop impedance;
- Part 4: Earth resistance and equipotential earth resistance;
- Part 5: Resistance to Earth;
- Part 6: Effectiveness of residual current devices (RCD) in TT, TN and IT systems;
- Part 7: Phase sequence;
- Part 8: Insulation monitoring devices in IT systems;
- Part 9: Insulation fault location equipment in IT systems;
- Part 10: Combined measuring equipment for testing, measuring or monitoring protective measures;
- Part 11: Effectiveness of residual current monitors (RCM) in TT, TN and IT systems;
- Part 12: Power measurement and monitoring devices (PMD).

This document is equivalent to IEC 61557-11:2020 "Electrical safety equipment for low voltage power distribution systems up to 1 000 V AC and 1 500 V DC" Testing, measuring or monitoring equipment for complete protective measures - Part 11: Residual current monitors (RCM) for TT, TN and IT systems Effectiveness.

The following minimal editorial changes were made to this document.

- Corrected the editorial error in 4.3 of IEC 61557 - 11:2020, from "Figure 1 in IEC 61010 - 1:2010" to "IEC 61010-1:2010 Figure 2";
- Correct the editorial error in the formula in Note 6.1 of IEC 61557-11:2020, changing from " $R_{A\max} = U L \Delta I_{\Delta t}$ " to " $R_{A\max} = U L \Delta I_{\Delta t}$ ".

Introduction

IEC 60364-6 specifies the initial testing, continuous monitoring and commissioning of electrical installations in TN, TT or IT systems.

In addition to specifying the general criteria for carrying out these tests, IEC 60364-6 also includes the Only in a few cases, such as when measuring insulation resistance, does IEC 60364-6 include the requirements for the measuring equipment used.

Circuit diagrams given as examples in IEC 60364-6 and referenced in the main body of the document are generally not applicable to Actual use.

When dangerous voltages are present in electrical installations and equipment is used

improperly or is damaged, testing can easily cause accidents.

Therefore, technicians need to rely on measuring devices that ensure the safety of the measuring method in addition to simplifying the measurement.

Applying the general rules for safety of electrical and electronic measuring equipment (IEC 61010-1) to perform protective measures testing is not sufficient in itself.

Measurements in power installations can pose a hazard not only to the technicians but also to third parties due to different measurement methods.

Likewise, in order to obtain an objective assessment of the equipment, for example, periodic testing, continuous insulation monitoring or in the case of performance assurance, an important prerequisite is to obtain reliable and comparable measurement results with measuring devices from different manufacturers.

GB/T 18216 Test Method for Electrical Safety Protection Measures for Low Voltage Distribution Systems with AC 1000 V and DC 1500 V and Below the purpose of the "Testing, Measuring or Monitoring Equipment" is to provide uniform principles for compliance with the above characteristics, which apply to nominal voltage AC Measuring and monitoring equipment for electrical safety tests and performance tests in systems up to 1 000 V and 1 500 V DC. GB/T 18216 it is planned to consist of 17 parts.

--Part 1: General requirements. The purpose is to establish the low voltage distribution system with a nominal voltage of 1 000 V AC and 1 500 V DC and below General requirements for test equipment used for measuring and monitoring electrical safety in systems.

-- Part 2: Insulation resistance. The purpose is to establish the insulation resistance of equipment and electrical installation equipment in the non-energized state.

Relevant requirements for resistance equipment.

-- Part 3: Loop impedance. The purpose is to establish the impedance between the line conductor and the protective conductor, between the line conductor and the neutral conductor, or between the line conductor and the neutral conductor.

Requirements for loop impedance equipment between two conductors.

--Part 4: Ground resistance and equipotential ground resistance. The purpose is to establish the ground conductor of the measuring equipment, the protective ground conductor and related requirements for the resistance of equipotential bonding conductors.

--Part 5: Resistance to Earth. The purpose is to establish the requirements for measuring equipment that uses AC voltage to measure resistance to earth.

-- Part 6: Effectiveness of residual current devices (RCD) in TT, TN and IT systems. The purpose is to establish the Requirements for measuring equipment for the effectiveness of

protective measures provided by residual current devices in TT, TN and IT systems.

--Part 7: Phase sequence. The purpose is to establish the requirements for measuring equipment used to test the phase sequence of three-phase distribution systems.

--Part 8: Insulation monitoring devices in IT systems. The purpose is to establish the relevant requirements for insulation monitoring devices in IT systems.

-- Part 9: Insulation fault location equipment in IT systems. The purpose is to establish the relevant About requirements.

-- Part 10: Combined measuring equipment for testing, measuring or monitoring protective measures. The purpose is to establish within a device Combined measurement that combines several measurement functions or test methods that conform to the individual parts of this series of standards Equipment requirements.

-- Part 11: Effectiveness of residual current monitors (RCM) in TT, TN and IT systems. The purpose is to establish Requirements for equipment for testing the effectiveness of residual current monitors (RCM) installed in power distribution systems.

--Part 12: Quantity measurement and monitoring devices (PMD). The purpose is to establish a comprehensive system for measuring and monitoring electrical parameters in power distribution systems.

Relevant requirements for combined electrical quantity measuring and monitoring devices.

-- Part 13: Hand-held and hand-operated current clamps and sensors for measuring leakage current in distribution systems.

Requirements for hand-held and hand-operated current clamps and sensors for measuring leakage current in electrical systems.

-- Part 14: Equipment for testing the safety of electrical equipment of machinery. The purpose is to specify the equipment for testing the safety of electrical equipment of machinery Special requirements for equipment.

-- Part 15: Functional safety requirements for insulation monitoring devices and insulation fault location equipment in IT systems.

Functional safety requirements for insulation monitoring devices and insulation fault location equipment in systems.

-- Part 16: Equipment for testing the effectiveness of protective measures for electrical equipment and/or medical electrical equipment. The purpose is to specify the test Particular requirements for equipment to ensure the effectiveness of protective measures for electrical equipment and/or medical electrical equipment.

--Part 17: Non-contact AC voltage indicators. The purpose is to specify the minimum performance of non-contact AC voltage indicators Require.