



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

GB/T 18216.1-2021

**Electrical safety in low voltage distribution systems up to 1 000 V a. c.
and 1 500 V d. c. - Equipment for testing, measuring or monitoring of
protective measures - Part 1: General requirements**

Issued on: May 21, 2021

Implemented on: December 1, 2021

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Requirements	5
4.1 General requirements	5
4.2 Affected quantity --- work uncertainty (B), percentage work uncertainty (B[%])	5
4.3 Rated operating conditions	6
4.4 Battery test device	7
4.5 Security	7
4.6 Electromagnetic compatibility	7
4.7 Mechanical strength against vibration	7
5 Logo and instruction manual	7
5.1 Overview	7
5.2 Logo	7
5.3 Manual	8
6 Experiment	8
6.1 Overview	8
6.2 Work uncertainty	8
6.3 Battery test device	9
6.4 Safety test	9
6.5 Electromagnetic compatibility test	9
6.6 Mechanical requirements	9
6.7 Marking and instruction manual	9
6.8 Record	9
Appendix A (informative) Application explanation of GUM in GB/T 18216	10
Appendix B (Informative) Environmental Factors	12
Reference	15

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 of Standardization Documents"

Drafting.

This document is the test of GB/T 18216 "AC 1000V and DC 1500V and below low-voltage power distribution system electrical safety protection measures"

Part 1 of "Inspection, Measuring or Monitoring Equipment". GB/T 18216 has released the following parts.

- Part 1.General requirements;
- Part 2.Insulation resistance;
- Part 3.Loop impedance;
- Part 4.Grounding resistance and equipotential grounding resistance;
- Part 5.Resistance to ground;
- Part 8.Insulation monitoring device in IT system;
- Part 9.Insulation fault location equipment in IT systems;
- Part 12.Performance Measurement and Monitoring Device (PMD).

This document replaces GB/T 18216.1-2012 "Electrical safety protection of low-voltage power distribution systems below 1000V AC and 1500V DC

Test, measurement or monitoring equipment for protective measures Part 1.General requirements, compared with GB/T 18216.1-2012, except for structural adjustments and

In addition to editorial changes, the main technical changes are as follows.

- The terminology is consistent with IEC 60050;
- The measurement of uncertainty is modified according to the formula 4.2 of ISO /IEC Guide98-3:2008 (GUM);
- Updated the references of safety requirements and EMC requirements;
- Updated the reference of signs and operating instructions;
- Updated the references of safety and EMC tests;
- Appendix A contains the explanation of GUM;
- Appendix B puts forward environmental factors.

The translation method used in this document is equivalent to the IEC 61557-1:2019 "AC 1000V and DC 1500V and below low-voltage power distribution system

Testing, measuring or monitoring equipment for integrated electrical safety protection measures. Part 1.General requirements.

The Chinese documents that have consistent correspondence with the normatively cited

international documents in this document are as follows.

---GB/T 156-2017 standard voltage (IEC 60038.2009, MOD);

---GB/T 18216.8-2015 Electrical safety protection facilities for low-voltage power distribution systems below 1000V AC and 1500V DC

Part 8. Insulation monitoring device in IT system (IEC 61557-8.2007, IDT);

---GB/T 18216.9-2015 Electrical safety protection measures for low-voltage power distribution systems below 1000V AC and 1500V DC

Testing, measuring or monitoring equipment for the test. Part 9. Insulation fault locating equipment in IT systems (IEC 61557-9.2009,

IDT);

---GB/T 18268.1-2010 Electromagnetic compatibility requirements for electrical equipment for measurement, control and laboratory use-Part 1. General

Requirements (IEC 61326-1.2005, IDT).

Introduction

IEC 60364-6 specifies the first test, continuous monitoring and adjustment of these equipment in TN, TT or IT systems.

Standardized conditions for the post-adjustment test. In addition to the general standards that specify the implementation of these tests, IEC 60364-6 also includes

To verify the requirements. Only in a few cases, such as when measuring insulation resistance, does IEC 60364-6 include the measuring device used.

Details of the characteristics of the settings. Circuit diagrams given as examples in IEC 60364-6 and cited in the main text of the document are generally not applicable

actual use.

When dangerous voltages appear in the electrical installation and the equipment is improperly used or defective, the implementation of the test in the electrical installation can easily cause concern.

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

The application of the general safety rules for electrical and electronic measuring devices (IEC 61010-1) for protective measures is in itself insufficient. in

Measurements in power installations are not only harmful to technicians, but also to third parties due to different measurement methods.

Similarly, in order to obtain an objective judgment about the equipment, such as periodic tests, continuous insulation monitoring, or

In the case of performance assurance, an important prerequisite is to use measurement devices from different manufacturers to obtain reliable and comparable measurement results.

The purpose of GB/T 18216 is to specify uniform principles that are consistent with the above characteristics. These principles are applicable to nominal voltage AC

Measuring and monitoring equipment for electrical safety test and performance test in 1000V and DC 1500V and below systems. GB/T 18216

It is proposed to consist of ten parts.

---Part 1.General requirements. The purpose is to establish a low-voltage power distribution system with nominal voltages of AC 1000V and DC 1500V and below

General requirements for test equipment used for electrical safety measurement and monitoring in the system.

---Part 2.Insulation resistance. The purpose is to establish that the measurement is suitable for the insulation of equipment and electrical installation equipment in a non-excited state

Relevant requirements for resistance equipment.

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

The relevant requirements of the loop impedance device between the line conductors.

---Part 4.Grounding resistance and equipotential grounding resistance. The purpose is to establish the grounding conductor, protective grounding conductor and

And the relevant technical requirements for the resistance of the equipotential bonding conductor.

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

---Part 6.Effectiveness of Residual Current Device (RCD) in TT, TN and IT systems. The purpose is to establish that the measurement is suitable for

Relevant requirements for test equipment for the effectiveness of protective measures for residual current devices in TT, TN and IT systems.

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