
Električna varnost v nizkonapetostnih razdelilnih sistemih za izmenične napetosti do 1 kV in enosmerne napetosti do 1,5 kV - Oprema za preskušanje, merjenje ali nadzorovanje zaščitnih ukrepov - 16. del: Oprema za preskušanje učinkovitosti zaščitnih ukrepov električne opreme oziroma medicinske električne opreme (IEC 61557-16:2023)

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 16: Equipment for testing the effectiveness of the protective measures of electrical equipment and/or medical electrical equipment (IEC 61557-16:2023)

<https://standards.iteh.ai>

Elektrische Sicherheit in Niederspannungsnetzen bis AC 1 000 V und DC 1 500 V - Geräte zum Prüfen, Messen oder Überwachen von Schutzmaßnahmen - Teil 16: Geräte zur Prüfung der Wirksamkeit der Schutzmaßnahmen von elektrischen Geräten und/oder medizinisch elektrischen Geräten (IEC 61557-16:2023)

<https://standards.iteh.ai/catalog/standards/sist/6fb48900-d286-4db2-8541-e34aaa309595/sist-en-iec-61557-16-2025>

Sécurité électrique dans les réseaux de distribution basse tension de 1 000 V c.a. et 1 500 V c.c. - Dispositifs de contrôle, de mesure ou de surveillance de mesures de protection - Partie 16: Équipement pour les essais de bon fonctionnement des mesures de protection de l'équipement électrique et/ou de l'équipement médical électrique (IEC 61557-16:2023)

Ta slovenski standard je istoveten z: EN IEC 61557-16:2024

ICS:

| | | |
|-----------|---|---|
| 17.220.20 | Merjenje električnih in magnetnih veličin | Measurement of electrical and magnetic quantities |
| 29.080.01 | Električna izolacija na splošno | Electrical insulation in general |

SIST EN IEC 61557-16:2025

en,fr,de

EUROPEAN STANDARD

EN IEC 61557-16

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2024

ICS 17.220.20; 29.080.01

Supersedes EN 61557-16:2015

English Version

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 16: Equipment for
testing the effectiveness of the protective measures of electrical
equipment and/or medical electrical equipment
(IEC 61557-16:2023)

Sécurité électrique dans les réseaux de distribution basse
tension au plus égale à 1 000 V en courant alternatif et 1
500 V en courant continu - Dispositifs de contrôle, de
mesure ou de surveillance de mesures de protection -
Partie 16: Équipement pour les essais de bon
fonctionnement des mesures de protection des appareils
électriques et/ou des appareils électromédicaux
(IEC 61557-16:2023)

Elektrische Sicherheit in Niederspannungsnetzen bis AC 1
000 V und DC 1 500 V - Geräte zum Prüfen, Messen oder
Überwachen von Schutzmaßnahmen - Teil 16: Geräte zur
Prüfung der Wirksamkeit der Schutzmaßnahmen von
elektrischen Geräten und/oder medizinisch elektrischen
Geräten
(IEC 61557-16:2023)

This European Standard was approved by CENELEC on 2024-10-16. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 61557-16:2024 (E)**European foreword**

The text of document 85/876/FDIS, future edition 2 of IEC 61557-16, prepared by TC 85 "Measuring equipment for electrical and electromagnetic quantities" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61557-16:2024.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2025-12-31 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2027-12-31 document have to be withdrawn

This document supersedes EN 61557-16:2015 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document is read in conjunction with EN IEC 61557-1:2021.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

iTeh Standards
(<https://standards.iteh.ai>)
Endorsement notice
Document Preview

The text of the International Standard IEC 61557-16:2023 was approved by CENELEC as a European Standard without any modification.

<https://standards.iteh.ai>
SIST EN IEC 61557-16:2025

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

| | | |
|---------------|------|--------------------------|
| IEC 60990 | NOTE | Approved as EN 60990 |
| IEC 61000-4-8 | NOTE | Approved as EN 61000-4-8 |

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

| <u>Publication</u> | <u>Year</u> | <u>Title</u> | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-------------|---|--------------------|-------------|
| IEC 60529 | - | Degrees of protection provided by enclosures (IP Code) | EN 60529 | - |
| IEC 60601-1 | 2005 | Medical electrical equipment - Part 1: General requirements for basic safety and essential performance | EN 60601-1 | 2006 |
| - | - | | +AC | 2010 |
| + A1 | 2012 | | + A1 | 2013 |
| - | - | | + AC | 2014 |
| - | - | | + A12 | 2014 |
| + A2 | 2020 | | + A2 | 2021 |
| - | - | | + AC | 2022 |
| - | - | | + A13 | 2024 |
| IEC 61010-1 | 2010 | Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements | EN 61010-1 | 2010 |
| + A1 (mod) | 2016 | | + A1 | 2019 |
| - | - | | + AC | 2019 |
| IEC 61010-031 | - | Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 031: Safety requirements for hand-held and hand-manipulated probe assemblies for electrical test and measurement | EN IEC 61010-031 | - |
| IEC 61010-2-030 | - | Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-030: Particular requirements for equipment having testing or measuring circuits | EN IEC 61010-2-030 | - |

EN IEC 61557-16:2024 (E)

| <u>Publication</u> | <u>Year</u> | <u>Title</u> | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-------------|---|-----------------|-------------|
| IEC 61010-2-032 | - | Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-032: Particular requirements for hand-held and hand-manipulated current sensors for electrical test and measurement | EN 61010-2-032 | - |
| IEC 61010-2-034 | - | Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-034: Particular requirements for measurement equipment for insulation resistance and test equipment for electric strength | EN 61010-2-034 | - |
| IEC 61557-1 | 2019 | 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 1: General requirements | EN IEC 61557-1 | 2021 |
| IEC 61557-2 | - | 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 2: Insulation resistance | EN IEC 61557-2 | - |
| IEC 61557-4 | - | 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 4: Resistance of earth connection and equipotential bonding | EN IEC 61557-4 | - |
| IEC 61557-10 | - | 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 10: Combined measuring equipment | EN IEC 61557-10 | - |
| IEC 61557-13 | - | 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 13: Hand-held and hand-manipulated current clamps and sensors for measurement of leakage currents in electrical distribution systems | EN IEC 61557-13 | - |
| IEC 62353 | 2014 | Medical electrical equipment - Recurrent test and test after repair of medical electrical equipment | EN 62353 | 2014 |



IEC 61557-16

Edition 2.0 2023-08

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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 16: Equipment for testing the effectiveness of the protective measures of electrical equipment and/or medical electrical equipment

Sécurité électrique dans les réseaux de distribution basse tension au plus égale à 1 000 V en courant alternatif et 1 500 V en courant continu – Dispositifs de contrôle, de mesure ou de surveillance de mesures de protection –

Partie 16: Équipement pour les essais de bon fonctionnement des mesures de protection des appareils électriques et/ou des appareils électromédicaux

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 17.220.20, 29.080.01

ISBN 978-2-8322-7251-0

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

| | |
|---|----|
| FOREWORD..... | 4 |
| INTRODUCTION..... | 6 |
| 1 Scope..... | 7 |
| 2 Normative references | 7 |
| 3 Terms and definitions | 8 |
| 4 Requirements | 9 |
| 4.1 General requirements | 9 |
| 4.2 Measuring functions..... | 9 |
| 4.2.1 Minimum measuring function requirements | 9 |
| 4.2.2 Measurement of the resistance of the protective bonding or the protective earth resistance..... | 10 |
| 4.2.3 Measurement of insulation resistance | 10 |
| 4.2.4 Measurement of protective conductor current or equipment leakage current with the alternative method | 11 |
| 4.2.5 Measurement of touch current, patient leakage current and applied part leakage current with the alternative method | 11 |
| 4.2.6 Measurement of protective conductor current and equipment leakage current with the direct or differential (residual) method | 12 |
| 4.2.7 Measurement of touch current, patient leakage current and applied part leakage current with the direct or differential (residual) method | 13 |
| 4.3 Construction requirements | 13 |
| 4.3.1 Overvoltage capability | 13 |
| 4.3.2 Terminals | 13 |
| 4.3.3 Sockets for service purpose..... | 14 |
| 4.3.4 Degree of protection | 14 |
| 4.3.5 Class of protection..... | 14 |
| 4.3.6 Overvoltage and measurement categories | 14 |
| 4.3.7 Accessories | 14 |
| 5 Markings and operating instructions | 15 |
| 5.1 Markings | 15 |
| 5.2 Operating instructions | 15 |
| 6 Tests | 15 |
| 6.1 General..... | 15 |
| 6.2 Operating uncertainty..... | 15 |
| 6.3 Tests of measuring circuits according to measuring functions | 18 |
| 6.4 Test of construction requirements of test and measurement equipment..... | 18 |
| Annex A (normative) Measuring circuit MD | 19 |
| A.1 Current measuring circuit MD..... | 19 |
| A.2 Frequency characteristic of current measuring circuit MD | 20 |
| Bibliography..... | 21 |
| Figure A.1 – Current measuring circuit MD..... | 19 |
| Figure A.2 – Frequency characteristic of the current measuring circuit MD..... | 20 |

| | |
|--|----|
| Table 1 – Calculation of operating uncertainty for leakage measurements with direct or differential method | 17 |
| Table 2 – Compliance tests of measuring circuits according to measuring function | 18 |
| Table 3 – Compliance test of construction requirements of test and measuring equipment..... | 18 |

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[SIST EN IEC 61557-16:2025](https://standards.iteh.ai/catalog/standards/sist/6fb48900-d286-4db2-8541-e34aaa309595/sist-en-iec-61557-16-2025)

<https://standards.iteh.ai/catalog/standards/sist/6fb48900-d286-4db2-8541-e34aaa309595/sist-en-iec-61557-16-2025>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**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 16: Equipment for testing the effectiveness of the protective
measures of electrical equipment and/or medical electrical equipment**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 61557-16 has been prepared by IEC technical committee 85: Measuring equipment for electrical and electromagnetic quantities. It is an International Standard.

This second edition cancels and replaces the first edition published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) splitting of uncertainty requirements for medical and non-medical electrical equipment in 4.2.1;
- b) addition of a definition of ranges with defined uncertainty in 4.2.1 to 4.2.7;
- c) addition of an optional measuring device (MD) for non-medical devices in 4.2.1;