SLOVENSKI STANDARD

oSIST prEN 61557-1:2018

01-april-2018

Električna varnost v nizkonapetostnih razdelilnih sistemih izmenične napetosti do 1 kV in enosmerne napetosti do 1,5 kV - Oprema za preskušanje, merjenje ali nadzorovanje zaščitnih ukrepov - 1. del: Splošne zahteve

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

Elektrische Sicherheit in Niederspannungsnetzen bis AC 1 000 V und DC 1 500 V - Geräte zum Prüfen, Messen oder Überwachen von Schutzmaßnahmen - Teil 1: Allgemeine Anforderungen

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 1: Exigences générales

Ta slovenski standard je istoveten z: **prEN 61557-1:2018**

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
29.240.01	Omrežja za prenos in distribucijo električne energije na splošno	Power transmission and distribution networks in general

oSIST prEN 61557-1:2018 **en,fr,de**

85/629/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 61557-1 ED3**	
DATE OF CIRCULATION: **2018-02-09**	CLOSING DATE FOR VOTING: **2018-05-04**
SUPERSEDES DOCUMENTS: **85/607/CD,85/621/CC**	

IEC TC 85 : MEASURING EQUIPMENT FOR ELECTRICAL AND ELECTROMAGNETIC QUANTITIES	
SECRETARIAT: China	SECRETARY: Mr Bo Chen
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 23,TC 44,TC 62,TC 64,TC 66,TC 108	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY	
☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

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

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRICAL SAFETY IN LOW VOLTAGE DISTRIBUTION SYSTEMS UP TO 1 000 V AC AND 1 500 V DC – EQUIPMENT FOR TESTING AND MEASURING OR MONITORING OF PROTECTIVE MEASURES

Part 1: General requirements

FOREWORD

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International Standard IEC 61557-1 has been prepared by subcommittee TC85/WG8: MEASURING AND MONITORING EQUIPMENT FOR TESTING PROTECTIVE DEVICES IN ENERGY DISTRIBUTION SYSTEMS, of IEC technical committee 85: MEASURING EQUIPMENT FOR ELECTRICAL AND ELECTROMAGNETIC QUANTITIES

This third edition cancels and replaces the second edition published in 2007. This edition constitutes a technical revision.

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

a) Terms aligned with IEV
b) Measurement of uncertainty revised according to GUM formula in 4.2
c) Updated references for safety and EMC requirements
d) Updated references for marking and operating instructions

e) Updated references for testing safety and EMC

f) Annex A contains an explanation of GUM

g) Annex B addresses Eco-design

The text of this standard is based on the following documents:

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

The National Committees are requested to note that for this publication the stability date is 2025.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

INTRODUCTION

IEC 60364-6 stipulates standardized conditions for the initial test of power installations in TN, TT or IT systems for continuous monitoring and for testing these installations after modifications. In addition to general references for the performance of the tests, IEC 60364-6 contains requirements that have to be verified by measurements. Only in a few instances, for example when measuring the insulation resistance, the standard contains details of the characteristics of the measuring device to be used. Circuits which are given as examples in IEC 60364-6, and referred to within the text, are generally not suitable for practical use.

The tests are carried out in installations where hazardous voltages can occur and where careless use or a defect in the equipment can easily cause an accident. Therefore, the technician has to rely on measuring devices which ensure safe test methods, apart from simplification of the measurements.

The application of the general safety regulations for electrical and electronic measuring devices (IEC 61010-1) for testing the protective measures is not sufficient in itself. The performance of measurements in the installation can cause hazards not only to the technician, but also to third persons, depending on the measuring method.

Likewise, reliable and comparable results of measurement with measuring devices from different manufacturers are an important precondition in order to obtain an objective judgement about the installation, for example when the installation is handed over for periodic tests, for continuous insulation monitoring or in the case of performance warranty.

The series of IEC 61557 has been established with the aim of stipulating common principles for measuring and monitoring equipment for testing electrical safety and measuring performances in systems with nominal voltages up to 1 000 V AC and 1 500 V DC which correspond to the above-mentioned characteristics.

For this reason, the following common specifications have been stipulated in Part 1 and other individual parts of IEC 61557:

- protection against extraneous voltages;
- protection class II (except insulation monitoring devices and insulation fault location systems);
- specifications and safety precautions against hazardous touch voltages at the measuring device;
- specifications for the judgement of connection configurations with respect to wiring errors in the tested equipment;
- special mechanical requirements;
- measuring methods;
- measured quantity;
- specification of the maximum operating uncertainty;
- specifications for testing the influencing quantity and the calculation of the operating uncertainty;
- uncertainties of the measuring device at the thresholds specified in the respective standards;
- specification of the nature of type and routine tests and the required conditions for testing.

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

1 Scope

This part of IEC 61557 specifies the general requirements for measuring and monitoring equipment for testing the electrical safety in low voltage distribution systems with nominal voltages up to 1 000 V AC and 1 500 V DC.

When measuring equipment or measuring installations involve measurement tasks of various measuring equipment covered by this series of standards, then the part of this series of standards relevant to each of the measurement tasks is applicable.

NOTE The term "measuring equipment" will hereafter be used to designate "testing, measuring and monitoring equipment".

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60038:2009, Ed. 7.0, *IEC standard voltages*

IEC 60364-6:2016, COR1:2017, *Electrical installations of buildings – Part 6: Verification*

IEC 60664-1:2011, Ed. 2.0, *Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests*

IEC 60529:1989, AMD1:1999, AMD2:2013, CSV/COR2:2015, *Degrees of protection provided by enclosures (IP code)*

IEC 61010-1:2010, Ed.3.0, +AMD1:2016, *Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements*

IEC 61010-031:2015, Ed.:2.0, *Safety requirements for electrical equipment for measurement, control and laboratory use - Part 031: Safety requirements for hand-held probe assemblies for electrical measurement and test*

IEC 61010-2-030:2017, Ed.2.0, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Particular requirements for equipment having testing or measuring circuits*

IEC 61010-2-034:2017, Ed.1.0, *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*

IEC 61326-2-2:2012, Ed.2.0, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2-2: Particular requirements – Test configurations, operational conditions and performance criteria for portable test, measuring and monitoring equipment used in low-voltage distribution systems*

IEC 61326-2-4:2012, Ed.2.0, *Electrical equipment for measurement, control and laboratory use, - EMC requirements - Part 2: Particular requirements – Test configurations, operational conditions and performance criteria for insulation monitoring devices according to IEC 61557-8 and for equipment for insulation fault location according to IEC 61557-9*

3 Terms, definitions and symbols

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

– IEC Electropedia: available at http://www.electropedia.org/

– ISO Online browsing platform: available at http://www.iso.org/obp

3.1
nominal system voltage
U_n
value of the voltage by which the distribution system is designated and to which certain characteristics are assigned

3.2
voltage against earth
U_o
a) in distribution systems with an earthed neutral point, the voltage between a phase conductor and the earthed neutral point;

b) in all other distribution systems, the voltage present between the remaining phase conductors and earth when one of the phase conductors is short-circuited to earth

3.3
fault voltage
U_f
voltage between a given point of fault and reference earth resulting from an insulation fault

[SOURCE: IEV 826-11-02, modified: the symbol has been added]

3.4
(effective) touch voltage
U_t
voltage between conductive parts when touched simultaneously by a person or an animal

Note to entry: The value of the effective touch voltage may be appreciably influenced by the impedance of the person or the animal in electric contact with these conductive parts.

[SOURCE: IEV 195-05-11 and 826-11-05]

3.5
conventional touch voltage limit
U_L
maximum value of the touch voltage which is permitted to be maintained indefinitely in specified conditions of external influences and is usually equal to 50 V AC, r.m.s. or 120 V ripple free DC

[SOURCE: IEV 826-11-04, modified: ‘prospective’ has been omitted and values for the limit added]

3.6
supply voltage
voltage at a point where the measuring equipment does or can accept electric energy as a supply

Note 1 to entry: if a supply voltage is specified for instance in the supply contract, then it is called “declared supply voltage”.

3.7
rated supply voltage
U_S
value of the voltage at a point where the measuring equipment does or can accept electric energy as a supply

3.8
output voltage
U_a
voltage across the measuring equipment terminals where this equipment does or can output electric energy

3.9
open-circuit voltage
U_q
voltage present across unloaded terminals on the measuring equipment

3.10
rated voltage (or rated voltage ranges)
U_N
voltage value assigned by a manufacturer or other entity for a specified operating condition of the measuring equipment

Note 1 to entry: The value for the rated voltage of low voltage equipment is generally assigned from the list of nominal voltages in Tables 1 and 6 of IEC 60038:2009.

Note 2 to entry: Equipment may have more than one rated voltage value or may have a rated voltage range.

[SOURCE: IEV 614-03-09, modified: Note 1 has been omitted, term to specifically fit measuring equipment]

3.11
extraneous voltage
external voltage to which the measuring equipment can be subjected during measurement

3.12
rated current
I_N
current assigned by the manufacturer for the specified operating condition to the measuring equipment

Note to entry: The specified operating condition is a value (or values) within the rated operating conditions that are designed by the manufacturer.

[SOURCE: IEV 442-01-02, modified: for measuring equipment]

3.13
short-circuit current

over-current resulting from a short circuit due to a fault on the terminals or within the measuring equipment

3.14
rated frequency
f_N

frequency for which the measuring equipment is intended to be used and for which it has been designed

3.15
uncertainty (of measurement)
parameter, associated with the result of a measurement, that characterizes the dispersion of the values that could reasonably be attributed to the measurand

Note 1 to entry: This term is used in the "uncertainty" approach.

Note 2 – The parameter can be, for example, a standard deviation (or a given multiple of it), or a half-width of an interval having a stated level of confidence. Various ways of obtaining uncertainty are defined in the GUM.

Note 3 – Uncertainty of measurement comprises, in general, many components. Some of these components can be evaluated from the statistical distribution of the results of a series of measurements and can be characterized by experimental standard