SLOVENSKI STANDARD
oSIST prEN 61557-2:2018

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 - 2. del: Izolacijska upornost

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 2: Insulation resistance

Elektrische Sicherheit in Niederspannungsnetzen bis AC 1 000 V und DC 1 500 V - Geräte zum Prüfen, Messen oder Überwachen von Schutzmaßnahmen - Teil 2: Isolationswiderstand

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 2: Résistance d'isolement

Ta slovenski standard je istoveten z: **prEN 61557-2:2018**

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 61557-2:2018 **en,fr,de**

85/630/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 61557-2 ED3**	
DATE OF CIRCULATION: **2018-02-09**	CLOSING DATE FOR VOTING: **2018-05-04**
SUPERSEDES DOCUMENTS: **85/608/CD,85/622/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 26,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 **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.	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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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 2: Insulation resistance

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, MEASURING OR MONITORING OF PROTECTIVE MEASURES –

Part 2: Insulation resistance

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International Standard IEC 61557-2 has been prepared by subcommittee TC85: 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 edition includes the following significant technical changes with respect to the previous edition:

a) requirement for measurement category added
b) new requirements for operating instructions added
c) Alignment of the structure to the whole series IEC 61557

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.

This part of IEC 61557 shall be used in conjunction with Part 1.

A list of all parts in the IEC 61557 series, published under the general title 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 measure,' can be found on the IEC website.

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.

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

1 Scope

This part of IEC 61557 specifies the requirements applicable to equipment for measuring the insulation resistance of equipment and installations in the de-energized state.

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 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 61010-2-034:2017, 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 test*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61557-1 and 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
line-to-line voltage
phase-to-phase voltage (deprecated)

voltage between two line conductors at a given point of an electric circuit

[SOURCE: IEV 195-05-01]

4 Requirements

4.1 General

In addition to the requirements of Clause 4 of IEC 61557-1:20xx, the requirements of Clause 4 shall apply.

Insulation measurement equipment shall fulfil the safety requirements of IEC 61010-2-034.

Test leads and test probes used with insulation measuring equipment shall fulfil the requirements of IEC 61010-031.

Equipment intended for making measurements on distribution systems shall be rated at least for measurement category III.

Equipment intended for making measurements on electrical equipment shall be rated at least for measurement category II.

4.2 Output voltage

The output voltage shall be a DC voltage.

The open-circuit voltage shall not exceed 1,25 times the rated output voltage.

4.3 Rated current

The rated current shall be at least 1 mA.

4.4 Measuring current

The measuring current shall not exceed 15 mA peak. Any AC component present shall not exceed 1,5 mA peak.

4.5 Influence by an external capacitors

The indication of a measured resistance of 1 MΩ ± 1% shall not differ by more than 10 % as a result of possibly present AC voltage components in the output voltage, when a capacitor of 2 µF ± 10 % is connected in parallel with the measured resistance. If the manufacturer specifies a higher capacitance for the object under test, the 2 µF capacitor shall be replaced with the manufacturers specified capacitance value.

4.6 Overvoltage

The user shall not be subjected to danger, when extraneous d.c. or AC voltages up to 120 % of the highest rated output voltage are accidentally applied for a duration of 10 s to the measurement terminals of the measuring equipment.

When the measuring equipment bears one of the following markings, the applied extraneous AC overvoltage can be reduced to a voltage of 1,1 times the line-to-line voltage:

a) DO NOT USE IN DISTRIBUTION SYSTEMS WITH VOLTAGES HIGHER THAN ... V.

The marking shall be written in the corresponding country language.

The value of the voltage shown on the marking shall be 1,1 times the maximum line-to-line voltage.

or

b) Example of pictogram for a 500 V AC system

Figure 1 – Example of a pictogram for a 500 V AC system

The pictogram and outline shall contrast with the background. The value of the voltage shown on the marking shall be 1,1 times the maximum line-to-line voltage.

After applying thus reduced AC overvoltage, the equipment shall meet the specifications.

5 Marking and operating instructions

5.1 Marking

In addition to the marking in accordance with IEC 61557-1 and IEC 61010-2-034, Clause 5, the following information shall be provided on the measuring equipment.

– rated output voltage,

– rated current,

– measurement range,

– rated voltage to earth and measuring category.

5.2 Operating instructions

The operating instructions shall state the following information in addition to the statements specified in IEC 61557-1 and IEC 61010-2-034, Clause 5:

– a warning stating that measurements shall be carried out only on parts of an installation or equipment that is de-energized;

– a statement on the correct operation when power is supplied by a hand-driven generator;

– the possible number of measurements shall be stated for measuring equipment with power supplied by batteries/accumulators;

– a statement about the maximum capacitance value of the tested object if higher than 2 µF

– a statement about intended applications of the equipment,

– a statement about discharge time and relevant capacity of the tested object.

6 Tests

6.1 General

In addition to Clause 6 of IEC 61557-1 and Clause 6 of IEC 61010-2-034 the following tests shall be performed.

6.2 Operating uncertainty

The maximum percentage operating uncertainty within the measurement range to be marked or stated shall not exceed ±30 % with the measured value as fiducial value, as determined in accordance with Table 1.

The operating uncertainty shall apply under the rated operating conditions in accordance with IEC 61557-1.

– nominal value of the supply voltage;

– nominal r.p.m. when power is supplied by a hand-driven generator;

– reference temperature 23 °C ± 2 °C;

– reference position in accordance with the manufacturer's statement.

Table 1 – Calculation of operating uncertainty

Intrinsic uncertainty or influence quantity	Reference conditions or specified operating range	Designation code	Requirements or tests in accordance with relevant parts of IEC 61557	Type of test
Intrinsic uncertainty	Reference conditions	*A*	Part 2, subclause 6.2	R
Position	Reference position ± 90°	E_1	Part 1, subclause 4.2	R
Supply voltage	At the limits stated by the manufacturer	E_2	Part 1, subclauses 4.2, 4.3	R

Temperature	0 °C and 35 °C	E_3	Part 1, subclause 4.2	T
Operating uncertainty	$B = \pm\sqrt{A^2 + \frac{4}{3}\sum_i E_i^2}$		Part 2, subclause 6.2	R
A = intrinsic uncertainty E_i = variations R = routine test T = type test F = fiducial value	$B\,[\%] = \pm\frac{B}{F}\cdot 100\,\%$			

6.3 Open-circuit voltage

The open-circuit voltage shall be checked with a test circuit with a loading resistance of a minimum of $U_N \cdot (100k\Omega/V)$ for compliance with the specification in 4.2 *(routine test)*.

6.4 Rated current

The rated current shall be tested through a test resistor of a value of $U_N \cdot (1000\Omega/V)$

Compliance requirements in 4.3 shall be checked (routine test).

6.5 Measuring current

The measuring current shall be tested and compliance with the requirements in 4.4. shall be checked (routine test).

When an AC voltage is superimposed on the d.c. voltage, the measuring equipment for measuring the peak value of the current shall be applied.

6.6 Overvoltage tests

6.6.1 Overvoltage tests with AC voltage

The permissible overvoltage in accordance with 4.6 shall be tested. For this purpose an AC voltage according to 4.6. shall be applied for a duration of 10 s whilst the equipment is switched on and off (type test).

The AC test source shall have the capability to activate protective devices and to indicate weak points of circuitry. If protective devices are activated or parts are damaged, the test shall be repeated with a test source having a capability according to 16.2 of IEC 61010-1:2010

After test with AC overvoltage according to 4.6, defects, if any, shall be clearly indicated, indications and displayed values shall not lead to unsafe interpretations.

After tests with AC overvoltages according to 4.6, the equipment shall stay within the specification.

This includes reactivation of protective devices by the user without any repair.

The replacement of fuses accessible to the user should be considered as reactivation of a protective device.

6.6.2 Overvoltage tests with DC voltage

In addition to the overvoltage tests with AC, a DC voltage of 1,2 times the magnitude of the highest rated output voltage stored on a capacitor of 2 µF shall be applied in both polarities whilst the equipment is switched on and off. After this, the measuring equipment shall stay within the specification, but without activation of the protective devices (type test).