SLOVENSKI STANDARD
oSIST prEN 61557-7:2018

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 - 7. del: Fazno zaporedje

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 7: Phase sequence

Elektrische Sicherheit in Niederspannungsnetzen bis AC 1 000 V und DC 1 500 V - Geräte zum Prüfen, Messen oder Überwachen von Schutzmaßnahmen - Teil 7: Drehfeld

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 7: Ordre de phases

Ta slovenski standard je istoveten z: **prEN 61557-7:2018**

<u>**ICS:**</u>

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 61557-7:2018 **en,fr,de**

85/635/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 61557-7 ED3**	
DATE OF CIRCULATION: **2018-02-09**	CLOSING DATE FOR VOTING: **2018-05-04**
SUPERSEDES DOCUMENTS: **85/613/CD,85/627/CC**	

IEC TC 85 : MEASURING EQUIPMENT FOR ELECTRICAL AND ELECTROMAGNETIC QUANTITIES	
SECRETARIAT: China	SECRETARY: Mr Bo Chen
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 64,TC 78	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 7: Phase sequence

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 7: Phase sequence

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International Standard IEC 61557-7 has been prepared by 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 minor revision.

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

a) Alignment of the structure to the whole series IEC61557

b) Updated requirements in 4.3 in accordance to new standard editions of IEC 61010 and IEC 61010-031

c) Information on the marking is complemented

d) Information on the operating instructions is complemented

e) Information on the testing of leads is complemented

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

FDIS	Report on voting
85/xxxx/FDIS	85/xxxx/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 of 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 measures, 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 document 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 7: Phase sequence

1 Scope

This part of IEC 61557 specifies the requirements for measuring equipment applied to testing the phase sequence in three-phase distribution systems. Indication of the phase sequence may be mechanical, visual and/or audible.

This part of IEC 61557 does not apply to additional measuring equipment for other quantities. It does not apply to monitoring relays.

2 Normative references

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.

IEC 60417, *Graphical symbols for use on equipment*

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

IEC 61010-031:2015, *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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61557-1 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

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.

4.2 Indication

All indication shall be unambiguous between 85 % and 110 % of the nominal system voltage and between 95 % and 105 % of the nominal system frequency.

Indication shall also be unambiguously detectable in the presence of visual or audible interference.

4.3 Measuring equipment

4.3.1 General

The measurement equipment shall be suitable for continuous operation and shall be specified at least for measurement category III in accordance with IEC 61010-2-030. Measuring equipment designed without test leads intended to be used on socket-outlets can be specified according measurement category II in accordance with IEC 61010-2-030.

The measuring equipment shall not be damaged nor shall the user be exposed to danger when the measuring equipment is connected to 120 % of the rated system voltage or to 120 % of its rated maximum voltage range.

4.3.2 Portable measuring equipment

Portable measuring equipment shall be housed in an enclosure of insulating material and comply with double insulation or reinforced insulation (protection class II).

Portable measuring equipment shall be designed in such a manner that when either one or two measuring leads are connected to earth and the remaining measuring leads are connected to their corresponding phase conductors, the resulting total current to earth should not exceed 3,5 mA r.m.s. The phase conductors shall be at 110 % of the maximum rated voltage for which the equipment is designed.

4.3.3 Test leads and accessories

Measuring equipment shall be provided with permanently connected test leads or with a plug device in accordance with IEC 61010-031.

The following applies to leads

- they shall have an outer diameter of at least 3,5 mm;
- the copper cross-section shall be at least 0,75 mm² ;
- they shall be made from individual wires with a diameter ≤ 0,07 mm;
- they shall be provided with double or reinforced insulation.

Test probes, clips and other accessories used with phase sequence indicators shall fulfil the requirements of IEC 61010-031.

A probe cable which has a wear indicator shall provide at least double insulation or reinforced insulation when new, and at least basic insulation when the wear indicator is reached, see IEC 61010-031.

Portable measuring equipment, together with their test leads, shall comply with the requirements for mechanical strength according to IEC 61010-1 and in addition shall be tested in accordance with 6.4.

These requirements do not apply when the phase sequence indicator forms part of a multi-purpose instrument with provisions for carrying.

5 Marking and operating instructions

5.1 Marking

In addition to Clause 5 of IEC 61557-1, the following information shall be provided on the measuring equipment.

- Symbol for double insulation in accordance with symbol 11 of Table 1 of IEC 61010-1.
- Designation of the leads L1, L2 and L3 on the equipment and on the leads.
- The measurement category shall be printed on the equipment close to the test lead connection.

5.2 Operating instructions

Clause 5.2 of IEC 61557-1 applies.

6 Tests

6.1 General

In addition to the tests of Clause 6 of IEC 61557-1, the following tests shall be performed.

6.1.1 Visual display

Tests of the visual display are performed under the following conditions.

The display shall be unambiguously discernible from a distance of 500 mm at lighting levels from 30 lx to 1 000 lx. During the measurement, the measuring equipment shall be placed on a matt grey surface (type test).

A visual comparison under reference conditions with equipment that has successfully passed the type test is adequate for a routine test with respect to the visual display. The display on the item under test shall produce a similar or better readability (routine tests).

6.1.2 Audible indication (if applicable)

The test for the audible indication is performed at a sound level of 75 dB(A) (white noise). The indication shall be unambiguously discernible under these conditions (routine test).

6.2 Leakage current

The requirements under 4.3.2 shall be tested as follows:

The phase sequence indicator shall be connected in series with a current measuring instrument on one lead connected with earth, and with the interconnected other leads connected with a phase conductor at a voltage of 110 % of its rated voltage or a voltage at the upper limit of its rated voltage range. The magnitude of the current shall not exceed the value under 4.3.2.

This test shall be executed on each conductor *(routine test)*.

6.3 Test of mechanical requirements (type tests)

6.3.1 Mechanical shock test

For the purpose of a mechanical shock test, the item under test shall be suspended as shown in Figure A.1, using a pendulum length of 2 m. The item under test shall be dropped in a pendulum movement with a deflection of 1 m in height to hit a hard wooden plate 50 mm thick. The test shall be carried out so that each of the sides of the enclosure parallel to the suspension hits the wood once.

6.3.2 Test of leads

The strain relief of permanently attached leads shall be tested by a drop test in accordance with Figure A.2, in the following manner:

– the item under test shall be suspended so that it is caught with the extended lead after a free drop of 2 m;

– the item under test shall be dropped three times from the suspension point for each of the leads;

– the enclosure of the measuring equipment shall be free from damage;

– permanently attached leads shall not have become detached from the measuring equipment;

– live parts of the leads connected by means of plugs shall remain inaccessible when they have become unplugged from the measuring equipment;

– no parts inside the measuring equipment shall have become loose.

6.4 Overvoltage

The applicable requirement of 4.3.1 shall be tested as follows:

Compliance with the requirements given in 4.3.1 shall be tested by connecting, for a duration of 10 min, the item under test to a three-phase system at 120 % of the rated system voltage or, in the case of multi-range measuring equipment, at 120 % of all rated voltages *(type test)*.

The surface temperature of EUT shall be measured and checked according to IEC 61010-1.

Compliance with the requirements given in 4.3 shall be tested by operating the item under test for a duration of 1 h at the rated voltage or, in the case of multi-range measuring equipment, at all rated voltage values *(type test)*.

6.5 Test of markings

The markings shall be checked in respect of legibility by a visual inspection *(type test)*.