SLOVENSKI PREDSTANDARD

oSIST prEN 61557-7:2005

november 2005

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

ICS 17.220.20

Referenčna številka
oSIST prEN 61557-7:2005(en)

85/274/CDV

COMMITTEE DRAFT FOR VOTE (CDV)
PROJET DE COMITÉ POUR VOTE (CDV)

Project number Numéro de projet	IEC 61557-7 Ed. 2.0	
IEC/TC or SC: **TC 85** CEI/CE ou SC:	Date of circulation Date de diffusion **2005-07-29**	Closing date for voting (Voting mandatory for P-members) Date de clôture du vote (Vote obligatoire pour les membres (P)) **2006-01-06**
Titre du CE/SC: Equipement de mesure des grandeurs électriques et électromagnétiques	TC/SC Title: Measuring equipment for electrical and electromagnetic quantities	
Secretary: Mr. Bo CHEN Secrétaire:		
Also of interest to the following committees Intéresse également les comités suivants	Supersedes document Remplace le document 85/256/CD and 85/266/CC	
Functions concerned Fonctions concernées ☐ Safety / Sécurité ☐ EMC / CEM ☐ Environment / Environnement ☐ Quality assurance / Assurance qualité		

CE DOCUMENT EST TOUJOURS À L'ÉTUDE ET SUSCEPTIBLE DE MODIFICATION. IL NE PEUT SERVIR DE RÉFÉRENCE.

LES RÉCIPIENDAIRES DU PRÉSENT DOCUMENT SONT INVITÉS À PRÉSENTER, AVEC LEURS OBSERVATIONS, LA NOTIFICATION DES DROITS DE PROPRIÉTÉ DONT ILS AURAIENT ÉVENTUELLEMENT CONNAISSANCE ET À FOURNIR UNE DOCUMENTATION EXPLICATIVE.

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.

Titre :

Title : IEC 61557-7 Ed. 2.0: Electrical safety in low voltage distribution systems up to 1000 V a.c. and 1500 V d.c. - Equipment for testing, measuring or monitoring of protective measures - Part 7: Phase sequence

Note d'introduction

Introductory note

ATTENTION	ATTENTION
CDV soumis en parallèle au vote (CEI) et à l'enquête (CENELEC)	**Parallel IEC CDV/CENELEC Enquiry**

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

ELECTRICAL SAFETY IN LOW VOLTAGE DISTRIBUTION SYSTEMS UP TO 1000 V a.c. AND 1500 V d.c. – Equipment for testing, measuring or monitoring of protective measures –

Part 7: Phase sequence

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61557-7 has been prepared by IEC technical committee 85: Measuring equipment for electrical and electromagnetic quantities.

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

FDIS	Report on voting
85/xx/FDIS	85/xxx/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.

Annex A forms an integral part of this standard.

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

The committee has decided that the contents of this publication will remain unchanged until **2010.** At this date, the publication will be

- reconfirmed;

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

ELECTRICAL SAFETY IN LOW VOLTAGE DISTRIBUTION SYSTEMS UP TO 1000 V a.c. AND 1500 V d.c. – 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 ancillary measuring equipment for other quantities, for example voltage testers comprising an additional phase sequence indicator. It does not apply to monitoring relays.

NOTE Phase lamps are not considered to be voltage testers.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61557. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 61557 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60417: 1973 (Update required), *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets*

IEC 61557-1: 1997, *Electrical safety in low voltage distribution systems up to 1000 V a.c. and 1500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 1: General requirements*

3 Definitions

For the purposes of this part of IEC 61557, the definitions given in IEC 61557-1 apply.

4 Requirements

The following requirements as well as those given in IEC 61557-1 shall apply.

4.1 Indication shall be unambiguous between ~~80~~85 % and 110 % of the nominal system voltage or within the range of the nominal voltage and between 95% and 105% of the nominal system frequency.

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

4.3 The measuring equipment shall be suitable for continuous operation.

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

4.5 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 nominal voltage for which the equipment is designed.

4.6 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 nominal system voltage or to 120% of its rated maximum voltage range.

4.7 Portable measuring equipment shall be provided with permanently attached leads or with a plug device with live parts not accessible, whether plugged or unplugged (according to 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.

4.8 Portable measuring equipment, together with their leads, shall comply with the mechanical requirements and shall be tested in accordance with 6.3. After these tests:

– 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.

4.9 Requirements given in 4.8 need not apply when the phase sequence indicator forms part of multi-purpose measuring equipment, provided that the following conditions are met:

– live parts of the leads remain inaccessible even when they have become unplugged from the measuring equipment;

– the measuring equipment shall be suitable for being carried, for example over the shoulder, when measurements are carried out.

5 Marking and operating instructions

5.1 *Marking*

In addition to the marking in accordance with IEC 61557-1, the following information shall be provided on the measuring equipment.

5.1.1 Symbol for the protection class in accordance with IEC 60417, No. 5172.

5.1.2 Phase sequence.

5.1.3 Designation of the leads L1, L2 and L3 on the equipment and on the leads.

5.2 *Operating instructions*

The operating instructions need not include any statements other than the statements given in IEC 61557-1, except for the equipment mentioned in 4.9.

6 Tests

In addition to IEC 61557-1, with the exception of the tests given in 6.1 to 6.3, the following tests shall be executed.

6.1 Test of the detectability of the indication in accordance with 4.1 and 4.2.

6.1.1 Tests of the visual display are executed under the following conditions *(type tests).*

The display shall be unambiguously discernible from a distance of 500 mm at lighting levels from 30 lx to 1000 lx. During the measurement, the measuring equipment shall be placed on a matt grey surface.

A visual comparison under reference conditions with equipment that has successfully passed the 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.

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

6.2 Proof of compliance with the requirements under 4.5 shall be provided 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 nominal voltage or a voltage at the upper limit of its nominal voltage range. The magnitude of the current shall not exceed the value under 4.5.

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

6.3 Test of mechanical requirements *(type test)*

6.3.1 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 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.

6.4 Compliance with the requirements given in 4.6 shall be checked by visual inspection or by measurement *(type test).*

6.5 Compliance with the requirements given in 4.6 shall be tested by connecting, for a duration of 10 min, the item under test to a three-phase system at 120% of the nominal system voltage or, in the case of multi-range measuring equipment, at 120% of all nominal voltages *(type test).*

6.6 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 nominal voltage or, in the case of multi-range measuring equipment, at all nominal voltage values *(type test).*

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

6.8 Compliance with the requirements given in 4.9 shall be tested by visual inspection of the sling and with probe assemblies plugged and unplugged *(type test).*

6.9 The compliance with the tests in this clause shall be recorded.

Annex A
(normative)

Illustrations for mechanical tests

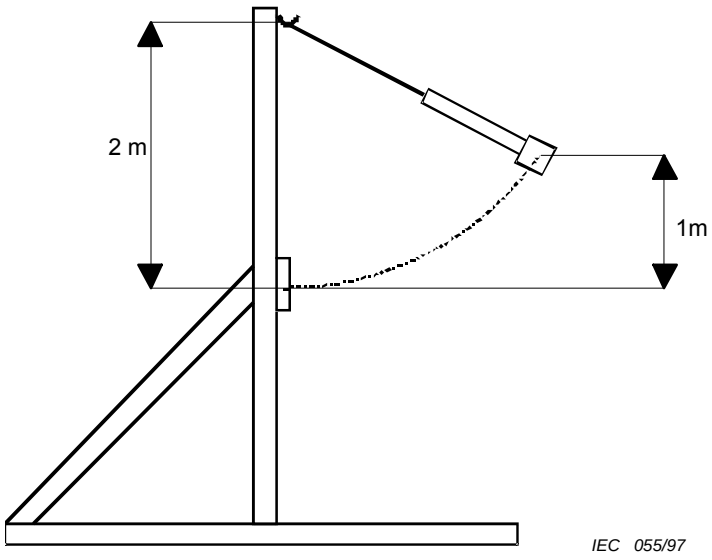

Figure A.1 – Mechanical shock test