

ELEKTRIOHUTUS MADALPINGSÜSTEEMIDE
VAHELDUVPIINGEGA KUNI 1000 V JA ALALISPIINGEGA
KUNI 1500 V. KAITSESÜSTEEMIDE KATSETUS-, MÕÕTE-
JA SEIRESEADMED. OSA 9:
ISOLATSIOONIRIKKELOKATSIOONISEADMED
IT-SÜSTEEMIDES

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 9: Equipment for insulation fault location in IT systems

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 61557-9:2015 sisaldab Euroopa standardi EN 61557-9:2015 ingliskeelset teksti.	This Estonian standard EVS-EN 61557-9:2015 consists of the English text of the European standard EN 61557-9:2015.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 13.02.2015.	Date of Availability of the European standard is 13.02.2015.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 25.040.40

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Aru 10, 10317 Tallinn, Eesti; koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Aru 10, 10317 Tallinn, Estonia; homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

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 9: Equipment for
insulation fault location in IT systems
(IEC 61557-9:2014)

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 9: Dispositifs de localisation de défauts
d'isolement pour réseaux IT
(IEC 61557-9:2014)

Elektrische Sicherheit in Niederspannungsnetzen bis AC 1
000 V und DC 1 500 V - Geräte zum Prüfen, Messen oder
Überwachen von Schutzmaßnahmen - Teil 9: Einrichtungen
zur Isolationsfehlersuche in IT-Systemen
(IEC 61557-9:2014)

This European Standard was approved by CENELEC on 2015-01-15. 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 85/486/FDIS, future edition 3 of IEC 61557-9, prepared by IEC/TC 85 "Measuring equipment for electrical and electromagnetic quantities" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61557-9:2015.

The following dates are fixed:

- latest date by which the document has to be (dop) 2015-10-15
implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2018-01-15
standards conflicting with the
document have to be withdrawn

This document supersedes EN 61557-9:2009

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

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD).

Endorsement notice

The text of the International Standard IEC 61557-9:2014 was approved by CENELEC as a European Standard without any modification.

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

IEC 60364-4-41:2005	NOTE	Harmonized as HD 60364-4-41:2007.
IEC 60664-1	NOTE	Harmonized as EN 60664-1.
IEC 60664-3	NOTE	Harmonized as EN 60664-3.
IEC 60947-5-1:2003	NOTE	Harmonized as EN 60947-5-1:2004.
IEC 60947-5-4:2002	NOTE	Harmonized as EN 60947-5-4:2003.
IEC 61140	NOTE	Harmonized as EN 61140.
IEC 61810-2:2011	NOTE	Harmonized as EN 61810-2:2011.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 When 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.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60068-2-1	-	Environmental testing -- Part 2-1: Tests - Test A: Cold	EN 60068-2-1	-
IEC 60068-2-2	-	Environmental testing -- Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	-
IEC 60068-2-6	-	Environmental testing -- Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	-
IEC 60068-2-27	-	Environmental testing -- Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	-
IEC 60364-7-710 (mod)	2002	Electrical installations of buildings -- Part 7-710: Requirements for special installations or locations - Medical locations	HD 60364-7-710	2012
IEC 60529	-	Degrees of protection provided by enclosures - (IP Code)	+AC	2013
IEC 60664	series	Insulation coordination for equipment within low-voltage systems	EN 60664	series
IEC 60721-3-1	-	Classification of environmental conditions -- Part 3: Classification of groups of environmental parameters and their severities -- Section 1: Storage	EN 60721-3-1	-
IEC 60721-3-2	-	Classification of environmental conditions -- Part 3: Classification of groups of environmental parameters and their severities -- Section 2: Transportation	EN 60721-3-2	-
IEC 60721-3-3	-	Classification of environmental conditions -- Part 3: Classification of groups of environmental parameters and their severities -- Section 3: Stationary use at weatherprotected locations	EN 60721-3-3	-
IEC 61010-1	2010	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements	EN 61010-1	2010
IEC 61010-2-030	-	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-030: Particular requirements for testing and measuring circuits	EN 61010-2-030	-
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 61010-031	-	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	EN 61010-031	-
IEC 61326-2-2	-	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	EN 61326-2-2	-
IEC 61326-2-4	-	Electrical equipment for measurement, control and laboratory use - EMC requirements -- Part 2-4: 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	EN 61326-2-4	-
IEC 61557-1	2007	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	EN 61557-1	2007
IEC 61557-8	-	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 8: insulation monitoring devices for it systems	EN 61557-8	-
CISPR 11	-	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	EN 55011	-

This document is a new generated by EVS

CONTENTS

FOREWORD	5
1 Scope	7
2 Normative references	7
3 Terms, definitions and abbreviations	8
3.1 Terms, definitions, symbols and units	8
3.2 Abbreviations	10
4 Requirements	10
4.1 General requirements	10
4.2 Mandatory functions provided by an IFLS	11
4.2.1 Location warning	11
4.2.2 Local location warning (LLW)	11
4.2.3 Remote location warning (RLW)	11
4.3 Optional functions provided by IFLS	12
4.3.1 Indication of the insulation value	12
4.3.2 Performance of the IFLS in case of the interruption of the connection to the locating current sensor (LCS)	12
4.4 Performance requirements	12
4.4.1 Response sensitivity	12
4.4.2 Locating current I_L	12
4.4.3 Locating voltage U_L	12
4.5 Electromagnetic compatibility (EMC)	12
4.6 Safety requirements	12
4.6.1 General	12
4.6.2 Clearances and creepage distances	12
4.6.3 Protection class and earth connection of the IFLS	13
4.7 Climatic environmental conditions	13
4.8 Mechanical requirements	13
4.8.1 General	13
4.8.2 Product mechanical robustness	13
4.8.3 IP protection class requirements	14
5 Marking and operating instructions	15
5.1 Marking	15
5.2 Operating instructions	15
6 Tests	16
6.1 General	16
6.2 Type tests	16
6.2.1 General	16
6.2.2 Test of response sensitivity of the IFLS	16
6.2.3 Test of the locating current I_L	17
6.2.4 Test of the locating voltage U_L	17
6.2.5 Test of the location warning	17
6.2.6 Test of the indication of the insulation value	17
6.2.7 Test of the performance of the LCI	17
6.2.8 Voltage test	17
6.2.9 Test of the electromagnetic compatibility (EMC)	18
6.2.10 Test of the loss of LCS connection	18

6.2.11	Test of the protection class and the earth connection of the IFLS	18
6.2.12	Inspection of the marking and operating instructions.....	18
6.2.13	Mechanical test	18
6.2.14	Record of the type test	18
6.3	Routine tests.....	18
6.3.1	General	18
6.3.2	Test of the response sensitivity.....	18
6.3.3	Test of the location warning.....	19
6.3.4	Test of the self-test function	19
6.3.5	Voltage test	19
6.3.6	Compliance with the tests of Clause 6	19
7	Overview of requirements and tests for IFLSs.....	19
Annex A (normative)	Equipment for insulation fault location in medical locations	20
A.1	Scope	20
A.2	Requirements	20
A.2.1	General	20
A.2.2	Performance requirements.....	20
A.2.3	Electromagnetic compatibility (EMC)	20
A.3	Marking and operating instructions.....	20
A.4	Tests	21
A.4.1	General	21
A.4.2	Type tests.....	21
Annex B (normative)	Portable equipment for insulation fault location	22
B.1	Scope	22
B.2	Requirements	22
B.2.1	General	22
B.2.2	Performance requirements.....	22
B.3	Marking and operating instructions.....	22
B.4	Tests	22
Annex C (informative)	Example of an IFLS and explanation of upstream and downstream system leakage capacitances.....	24
C.1	Examples of an IFLS.....	24
C.2	Upstream and downstream system leakage capacitance.....	26
Bibliography	27
Figure C.1	– Example of an IFLS	25
Figure C.2	– Explanation of upstream and downstream system leakage capacitance	26
Table 1	– Abbreviations	10
Table 2	– Product mechanical requirements.....	14
Table 3	– Minimum IP requirements for IFLS	15
Table 4	– Reference conditions for tests in operation.....	16
Table 5	– Reference conditions for storage tests	16
Table 6	– Requirements and tests on IFLSs.....	19

Table A.1 – Additional requirements applicable to equipment for insulation fault location in medical locations	21
Table A.2 – Emission test for equipment for insulation fault location in medical locations	21

This document is a preview generated by EVS

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 9: Equipment for insulation fault location in IT systems**

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.

International Standard IEC 61557-9 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 2009. This edition constitutes a technical revision.

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

- a) the scope, normative references, terms and definitions have been complemented;
- b) abbreviations are listed and explained;
- c) requirements, marking and operating instructions have been revised;
- d) mandatory and optional functions have been defined and their terminology has been adapted to IEC 61557-15;

- e) mechanical requirements have been added;
- f) Clause 6 “Tests” has been revised;
- g) new Tables have been added.

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

FDIS	Report on voting
85/486/FDIS	85/503/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 a.c. and 1 500 V d.c. – 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.