



SLOVENSKI STANDARD
SIST HD 60364-6:2016

01-september-2016

Nadomešča:
SIST HD 60364-6:2007

Nizkonapetostne električne inštalacije - 6. del: Preverjanje

Low-voltage electrical installations - Part 6: Verification

iTeh STANDARD PREVIEW
Installations électriques à basse tension - Partie 6: Vérification
(standards.iteh.ai)

Ta slovenski standard je istoveten z: HD 60364-6:2016

<https://standards.iteh.ai/catalog/standards/sist/a247c5ce-ab69-437b-b1b1-a157e22db3e4/sist-hd-60364-6-2016>

ICS:

91.140.50 Sistemi za oskrbo z elektriko Electricity supply systems

SIST HD 60364-6:2016

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST HD 60364-6:2016

<https://standards.iteh.ai/catalog/standards/sist/a247c5ce-ab69-437b-b1b1-a157c22db3c4/sist-hd-60364-6-2016>

HARMONIZATION DOCUMENT
DOCUMENT D'HARMONISATION
HARMONISIERUNGSDOKUMENT

HD 60364-6

July 2016

ICS 91.140.50

Supersedes HD 60364-6:2007

English Version

Low-voltage electrical installations - Part 6: Verification
(IEC 60364-6:2016)

Installations électriques à basse tension - Partie 6:
Vérification
(IEC 60364-6:2016)

Errichten von Niederspannungsanlagen - Teil 6: Prüfungen
(IEC 60364-6:2016)

This Harmonization Document was approved by CENELEC on 2016-06-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document at national level.

Up-to-date lists and bibliographical references concerning such national implementations may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This Harmonization Document exists in three official versions (English, French, German).

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.

[SIST HD 60364-6:2016](https://standards.iteh.ai/catalog/standards/sist/a247c5ce-ab69-437b-b1b1-a157c22db3c4/sist-hd-60364-6-2016)

<https://standards.iteh.ai/catalog/standards/sist/a247c5ce-ab69-437b-b1b1-a157c22db3c4/sist-hd-60364-6-2016>



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

HD 60364-6:2016**European foreword**

The text of document 64/2107/FDIS, future edition 2 of IEC 60364-6 prepared by IEC/TC 64 "Electrical installations and protection against electric shock" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as HD 60364-6:2016.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2017-03-01
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-06-01

This document supersedes HD 60364-6:2007.

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.

Endorsement notice

iTeh STANDARD PREVIEW
(standards.iteh.ai)

The text of the International Standard IEC 60364-6:2016 was approved by CENELEC as a Harmonization Document without any modification.

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

IEC 60238	NOTE	Harmonized as EN 60238.
IEC 60364-4-43	NOTE	Harmonized as EN 60364-4-43.
IEC 61557-2	NOTE	Harmonized as EN 61557-2.
IEC 61557-3	NOTE	Harmonized as EN 61557-3.
IEC 61557-5	NOTE	Harmonized as EN 61557-5.
IEC 61557-8	NOTE	Harmonized as EN 61557-8.
IEC 62020	NOTE	Harmonized as EN 62020.

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 60079-17	-	Explosive atmospheres -- Part 17: Electrical installations inspection and maintenance	17:EN 60079-17	-
IEC 60364 series		Low-voltage electrical installations	HD 60364 series	
IEC 60364-4-41:2005 (mod)		Low-voltage electrical installations -- Part 4-41: Protection for safety - Protection against electric shock	HD 60364-4-41	2007
-	-		+ corrigendum Jul.	2007
IEC 60364-4-42:2010 (mod)		Low-voltage electrical installations - Part 4-42: Protection for safety - Protection against thermal effects	HD 60364-4-42	2011
+ A1	2014		+ A1	2015
IEC 60364-4-44:2007 (mod)		Low-voltage electrical installations -- Part 4-44: Protection for safety - Protection against voltage disturbances and electromagnetic disturbances	HD 60364-4-44	2012
+ A1 (mod)	2015		HD 60364-4-443	2016
IEC 60364-5-51:2005 (mod)		Electrical installations of building -- Part 5-51: Selection and erection of electrical equipment - Common rules	HD 60364-5-51	2009
-	-		+ A11	2013
IEC 60364-5-52:2009 (mod)		Low-voltage electrical installations -- Part 5-52: Selection and erection of electrical equipment - Wiring systems	HD 60364-5-52	2011
IEC 60364-5-53	2001	Electrical installations of buildings -- Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control		-
+ A1 (mod)	2002		HD 60364-5-534	2008
+ A2 (mod)	2015		HD 60364-5-534	2016
IEC 60364-5-54	-	Low-voltage electrical installations -- Part 5-54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors	HD 60364-5-54	-
IEC 61557-6	-	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 6: Effectiveness of residual current devices (RCD) in TT, TN and IT systems	EN 61557-6	-

HD 60364-6:2016

IEC 61557 series Electrical safety in low voltage distributionEN 61557 series
systems up to 1 000 V a.c. and 1 500 V
d.c. - Equipment for testing, measuring or
monitoring of protective measures

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

[SIST HD 60364-6:2016](#)

<https://standards.iteh.ai/catalog/standards/sist/a247c5ce-ab69-437b-b1b1-a157c22db3c4/sist-hd-60364-6-2016>



IEC 60364-6

Edition 2.0 2016-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Low voltage electrical installations –
Part 6: Verification

ITh STANDARD PREVIEW
(standards.iteh.ai)

Installations électriques à basse tension –
Partie 6: Vérification

SIST HD 60364-6:2016
standards.iteh.ai/catalog/standards/sist/a247c5ce-ab69-437b-b1b1-
a157c22db3c4/sist-hd-60364-6-2016

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 91.140.50

ISBN 978-2-8322-3347-4

Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

CONTENTS

FOREWORD.....	4
6.1 Scope	6
6.2 Normative references	6
6.3 Terms and definitions	7
6.4 Initial verification	7
6.4.1 General	7
6.4.2 Inspection	8
6.4.3 Testing	9
6.4.4 Reporting for initial verification	14
6.5 Periodic verification	15
6.5.1 General	15
6.5.2 Frequency of periodic verification	16
6.5.3 Reporting for periodic verification	16
Annex A (informative) Estimation of the resistance value likely to be obtained during continuity testing.....	18
Annex B (informative) Methods for measuring the insulation resistance/impedance of floors and walls to earth or to the protective conductor	19
B.1 General.....	19
B.2 Test method for measuring the impedance of floors and walls with a.c. voltage.....	19
B.3 Test electrode 1	20
B.4 Test electrode 2	20
Annex C (informative) Measurement of earth electrode resistance – Methods C1, C2 and C3	22
C.1 Method C1 – Measurement of earth electrode resistance using an earth electrode test instrument	22
C.2 Method C2 – Measurement of earth electrode resistance using a fault loop impedance test instrument.....	23
C.3 Method C3 – Measurement of earth electrode resistance using current clamps	24
Annex D (informative) Guidance on the application of the rules of Clause 6.4 – Initial verification.....	26
Annex E (informative) Model forms for reporting	29
Annex F (informative) Model forms for inspection of electrical installations.....	36
F.1 Model schedule for items requiring inspection for initial verification of an electrical installation.....	36
F.2 Model inspection schedule of items requiring inspection for an existing electrical installation.....	40
Annex G (informative) Model schedule of circuit details and test results	45
Annex H (informative) List of notes concerning certain countries.....	46
Bibliography	48
Figure B.1 – Test electrode 1	20
Figure B.2 – Test electrode 2	21
Figure C.1 – Measurement of the earth electrode resistance.....	23
Figure C.2 – Measurement of the earth electrode resistance using an earth fault loop impedance test instrument	24
Figure C.3 – Measurement of earth electrode resistance using current clamps	25

Table 6.1 – Minimum values of insulation resistance.....	10
Table A.1 – Specific conductor resistance R for copper wiring at 30 °C dependent on the nominal cross-sectional area S for rough calculation of conductor resistances	18
Table E.1 – Electrical installation verification report (new or altered installation)	29
Table E.2 – Electrical installation condition report (existing installations).....	32
Table G.1 – Model schedule of circuit details and test results	45

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST HD 60364-6:2016](https://standards.iteh.ai/catalog/standards/sist/a247c5ce-ab69-437b-b1b1-a157c22db3c4/sist-hd-60364-6-2016)

<https://standards.iteh.ai/catalog/standards/sist/a247c5ce-ab69-437b-b1b1-a157c22db3c4/sist-hd-60364-6-2016>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW VOLTAGE ELECTRICAL INSTALLATIONS –

Part 6: Verification

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 60364-6 has been prepared by the IEC technical committee 64: Electrical installations and protection against electric shock.

This second edition cancels and replaces the first edition published in 2006 and constitutes a technical revision.

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

- a) Normative references updated to current publications;
- b) Re-numbered to align with current IEC numbering;
- c) Initial inspection requirements: 3 items added;
- d) Testing sequence changed;
- e) General requirements for periodic reporting – more details added;
- f) New Annex A: Table A.1 – Specific resistance values for copper conductors;

- g) Annex D: Example of a diagram suitable for evaluation of voltage drop. Content removed;
- h) Annex E: Recommendation for electrical equipment which is being re-used in an electrical installation. Content removed;
- i) Annex F: Content replaced with new Annex E – Model forms for reporting;
- j) Annex G: Changed to Annex F – Model forms for inspection of electrical installations;
- k) Annex H: Changed to Annex G – Model schedule of circuit details and test results;
- l) Annex H: Listing of notes concerning some countries;
- m) Bibliography – Updated:

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

FDIS	Report on voting
64/2107/FDIS	64/2114/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.

A list of all parts in the IEC 60364 series, published under the general title *Low voltage electrical installations*, can be found on the IEC website.

The reader's attention is drawn to the fact that Annex H lists all of the "in-some-country" clauses on differing practices of a less permanent nature relating to the subject of this standard.

SIST HD 60364-6:2016

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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

LOW VOLTAGE ELECTRICAL INSTALLATIONS –

Part 6: Verification

6.1 Scope

This part of IEC 60364 provides requirements for initial and periodic verification of an electrical installation.

Clause 6.4 provides requirements for initial verification, by inspection and testing, of an electrical installation to determine, as far as reasonably practicable, whether the requirements of the other parts of IEC 60364 have been met and requirements for the reporting of the results of the initial verification. The initial verification takes place upon the completion of a new installation or completion of an addition or an alteration to an existing installation.

Clause 6.5 provides requirements for periodic verification of an electrical installation to determine, as far as reasonably practicable, whether the installation and all its constituent equipment are in a satisfactory condition for use and requirements for the reporting of the results of the periodic verification.

6.2 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.

SIST HD 60364-6:2016

<https://standards.iteh.ai/catalog/standards/sist/a247c5ce-ab69-437b-b1b1->

IEC 60079-17, *Explosive atmospheres – Part 17: Electrical installations inspection and maintenance*

IEC 60364 (all parts), *Low-voltage electrical installations*

IEC 60364-4-41:2005, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60364-4-42:2010, *Low-voltage electrical installations – Part 4-42: Protection for safety – Protection against thermal effects*
IEC 60364-4-42:2010/AMD1:2014

IEC 60364-4-44:2007, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*
IEC 60364-4-44:2007/AMD1:2015

IEC 60364-5-51:2005, *Electrical installations of buildings – Part 5-51:– Selection and erection of electrical equipment – Common rules*

IEC 60364-5-52:2009, *Low-voltage electrical installations – Part 5-52: Selection and erection of electrical equipment – Wiring systems*

IEC 60364-5-53:2001, *Electrical installations of buildings – Part 5-53: Selection and erection of electrical equipment – Isolation, switching and control*
IEC 60364-5-53:2001/AMD1:2002
IEC 60364-5-53:2001/AMD2:2015

IEC 60364-5-54, *Low-voltage electrical installations – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements and protective conductors*

IEC 61557 (all parts), *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*

IEC 61557-6, *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 6: Effectiveness of residual current devices (RCD) in TT, TN and IT systems*

6.3 Terms and definitions

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

6.3.1 verification

all measures by means of which compliance of the electrical installation with the relevant requirements of IEC 60364 is checked

Note 1 to entry: Verification comprises inspection, testing and reporting.

6.3.2 inspection

examination of an electrical installation using all appropriate senses in order to ascertain correct selection and proper erection of electrical equipment.

6.3.3 testing

implementation of measures to assess an electrical installation by means through which its effectiveness is proved.

Note 1 to entry: Testing includes ascertaining values by means of appropriate measuring instruments, said values not being detectable by inspection.

6.3.4 reporting

recording of the results of inspection and testing

6.3.5 maintenance

combination of all technical and administrative actions, including supervisory actions, intended to retain an item in, or restore it to, a state in which it can perform a required function

6.4 Initial verification

6.4.1 General

6.4.1.1 Every installation shall be verified during erection, as far as reasonably practicable, and on completion, before being put into service.

6.4.1.2 The information required by IEC 60364-5-51:2005, 514.5 and other information necessary for initial verification shall be made available to the person carrying out the initial verification.

6.4.1.3 The initial verification shall include comparison of the results with relevant criteria to confirm that the requirements of the IEC 60364 series have been met.

6.4.1.4 Precautions shall be taken to ensure that the verification shall not cause danger to persons or livestock and shall not cause damage to property and equipment even if the circuit is defective.

6.4.1.5 It shall be verified that an extension, addition or alteration to an existing installation complies with the IEC 60364 series and does not impair the safety of that installation, and that the safety of the new installation is not impaired by the existing installation.

6.4.1.6 The verification shall be made by a skilled person, competent in verification.

NOTE Requirements concerning qualifications are a matter for national consideration.

6.4.2 Inspection

6.4.2.1 Inspection shall precede testing and shall normally be done prior to energizing the installation.

6.4.2.2 The inspection shall be made to confirm that electrical equipment which is part of the fixed installation is:

- in compliance with the safety requirements of the relevant equipment standards;

NOTE This can be ascertained by examination of the manufacturer's information, marking or certification.

- correctly selected and erected according to the IEC 60364 series and taking into account the manufacturer's instructions;
- not visibly damaged or defective so as to impair safety.

6.4.2.3 Inspection shall include at least the checking of the following, where relevant:

- a) method of protection against electric shock (see IEC 60364-4-41);
- b) presence of fire barriers and other precautions against propagation of fire and protection against thermal effects (see IEC 60364-4-42 and IEC 60364-5-52:2009, Clause 527);
- c) selection of conductors for current-carrying capacity (see IEC 60364-4-43 and IEC 60364-5-52:2009, Clauses 523);
- d) choice, setting, selectivity and coordination of protective and monitoring devices (see IEC 60364-5-53:2001, Clause 536);
- e) selection, location and installation of suitable overvoltage protective devices (SPD) where specified (see IEC 60364-5-53:2001 and IEC 60364-5-53:2001/AMD2:2015, Clause 534);
- f) selection, location and installation of suitable isolating and switching devices (see IEC 60364-5-53:2001, Clause 536);
- g) selection of equipment and protective measures appropriate to external influences and mechanical stresses (see IEC 60364-4-42:2010, Clause 422, IEC 60364-5-51:2005, 512.2 and IEC 60364-5-52:2009, Clause 522);
- h) identification of neutral and protective conductors (see IEC 60364-5-51:2005, 514.3);
- i) presence of diagrams, warning notices or similar information (see IEC 60364-5-51:2005, 514.5);
- j) identification of circuits, overcurrent protective devices, switches, terminals etc. (see IEC 60364-5-51:2005, Clause 514);
- k) adequacy of termination and connection of cables and conductors (see IEC 60364-5-52:2009, Clause 526);
- l) selection and installation of earthing arrangements, protective conductors and their connections (see IEC 60364-5-54);
- m) accessibility of equipment for convenience of operation, identification and maintenance (see IEC 60364-5-51:2005, Clauses 513 and 514);
- n) measures against electromagnetic disturbances (see IEC 60364-4-44:2007, Clause 444);

- o) exposed-conductive-parts are connected to the earthing arrangement (see IEC 60364-4-41:2005, Clause 411);
- p) selection and erection of the wiring systems (see IEC 60364-5-52:2009, Clauses 521 and 522).

Inspection shall include all particular requirements for special installations or locations.

6.4.3 Testing

6.4.3.1 General

The test methods described in 6.4.3 are given as reference methods; other methods are not precluded, provided they give no less valid results.

Measuring instruments and monitoring equipment and methods shall be chosen in accordance with the relevant parts of the IEC 61557 series. If other measuring equipment is used, it shall provide no less a degree of performance and safety.

The following tests shall be carried out where relevant and should preferably be made in the following sequence:

- a) continuity of conductors (see 6.4.3.2);
- b) insulation resistance (see 6.4.3.3);
- c) insulation resistance testing to confirm the effectiveness of protection by SELV, PELV or electrical separation (see 6.4.3.4);
- d) insulation resistance testing to confirm the effectiveness of floor and wall resistance/impedance (see 6.4.3.5);
- e) polarity test (see 6.4.3.6);
- f) testing to confirm effectiveness of automatic disconnection of supply (see 6.4.3.7);
- g) testing to confirm the effectiveness of additional protection (see 6.4.3.8);
- h) test of phase sequence (see 6.4.3.9);
- i) functional tests (see 6.4.3.10);
- j) voltage drop (see 6.4.3.11).

In the event of any test indicating failure to comply, that test and any preceding test, the results of which may have been influenced by the fault indicated, shall be repeated after the fault has been rectified.

When testing in a potentially explosive atmosphere appropriate safety precautions in accordance with IEC 60079-17 are necessary.

6.4.3.2 Continuity of conductors

The continuity of conductors and connection to exposed-conductive-parts, if any, shall be verified by a measurement of resistance on:

- a) protective conductors, including protective bonding conductors,
- b) exposed-conductive-parts, and
- c) in the case of ring final circuits, live conductors.

NOTE See also Annex A.

6.4.3.3 Insulation resistance of the electrical installation

The insulation resistance shall be measured between:

- a) live conductors, and