BRITISH STANDARD

BS EN
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

The European Standard EN 61557-1:2007 has the status of a British Standard

ICS 17.220.20; 29.080.01; 29.240.01

BSI
British Standards

National foreword

This British Standard was published by BSI. It is the UK implementation of EN 61557-1:2007. It is identical with IEC 61557-1:2007. It supersedes BS EN 61557-1:1997, which will be withdrawn on 1 March 2010.

The UK participation in its preparation was entrusted to Technical Committee PEL/85, Measuring equipment for electrical and electromagnetic quantities.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 29 June 2007

ISBN 978 0 580 50862 2

Amendments issued since publication

Amd. No.	Date	Comments

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61557-1

March 2007

ICS 17.220.20; 29.080.01; 29.240.01

Supersedes EN 61557-1:1997

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 1: General requirements

(IEC 61557-1:2007)

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 1: Exigences générales (CEI 61557-1:2007)

Elektrische Sicherheit in Niederspannungsnetzen bis AC 1 000 V und DC 1 500 V - Geräte zum Prüfen, Messen oder Überwachen von Schutzmaßnahmen - Teil 1: Allgemeine Anforderungen (IEC 61557-1:2007)

This European Standard was approved by CENELEC on 2007-03-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 61557-1:2007 E

Foreword

The text of document 85/290/FDIS, future edition 2 of IEC 61557-1, prepared by IEC TC 85, Measuring equipment for electrical and electromagnetic quantities, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61557-1 on 2007-03-01.

This European Standard supersedes EN 61557-1:1997.

The following changes were made with respect to EN 61557-1:1997:

– revision of the definitions;

– addition of influence quantities E_9 and E_{10};

– the subclause on Electromagnetic compatibility was complemented;

– inclusion of performance monitoring devices in the introduction;

– addition of new requirements for operating instructions.

This Part 1 specifies the general requirements. Parts 2 to 8 of EN 61557, which are to be used in conjunction with this Part 1, comprise specific specifications for individual measuring equipment.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2007-12-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2010-03-01

Annex ZA has been added by CENELEC.

———————

Endorsement notice

The text of the International Standard IEC 61557-1:2007 was approved by CENELEC as a European Standard without any modification.

———————

CONTENTS

INTRODUCTION

IEC 60364-6:2006, stipulates standardized conditions for the initial test of power installations in TN, TT or IT (IEC 60364) systems, for continuous monitoring and for testing these installations after modifications. In addition to general references for the execution of the tests, IEC 60364-6 contains requirements which have to be verified by measurement. Only in a few instances, for example when measuring the insulation resistance, the standard contains details of the characteristics of the measuring device to be used. Circuits which are given as examples in IEC 60364-6, and referred to within the text, are generally not suitable for practical use.

The tests are carried out in installations where hazardous voltages can occur and where careless use or a defect in the equipment can easily cause an accident. Therefore, the technician has to rely on measuring devices which ensure, apart from simplification of the measurements, safe test methods.

The application of the general safety regulations for electrical and electronic measuring devices (IEC 61010-1) for testing the protective measures is not sufficient in itself. The execution of measurements in the installation can cause hazards not only to the technician, but, depending on the measuring method, also to third persons.

Likewise, reliable and comparable results of measurement with measuring devices from different manufacturers are an important precondition in order to obtain an objective judgement about the installation, for example when the installation is handed over for periodic tests, for continuous insulation monitoring or in the case of performance warranty.

This series of standards has been established with the aim of stipulating common principles for measuring and monitoring equipment for testing electrical safety and measuring performances in systems with nominal voltages up to 1 000 V a.c. and 1 500 V d.c. which correspond to the above-mentioned characteristics.

For this reason, the following common specifications have been stipulated in Part 1 and other individual parts of the series of standards:

– protection against extraneous voltages;
– protection class II (except insulation monitoring devices);
– specifications and safety precautions against hazardous touch voltages at the measuring device;
– specifications for the judgement of connection configurations with respect to wiring errors in the tested equipment;
– special mechanical requirements;
– measuring methods;
– measured quantity;
– specification of the maximum operating uncertainty;
– specifications for testing the influencing quantity and the calculation of the operational uncertainty;
– uncertainties of the measuring device at the thresholds specified in the respective standards;
– specification of the nature of type and routine tests and the required conditions for testing.

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

1 Scope

This part of IEC 61557 specifies the general requirements for measuring and monitoring equipment for testing the electrical safety in low voltage distribution systems with nominal voltages up to 1 000 V a.c. and 1 500 V d.c.

When measuring equipment or measuring installations involve measurement tasks of various measuring equipment covered by this series of standards, then the part of this series of standards relevant to each of the measurement tasks is applicable.

NOTE The term "measuring equipment" will hereafter be used to designate "testing, measuring and monitoring equipment".

2 Normative references

The following referenced documents are indispensable for the application 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 60038:1983 [1)], *IEC standard voltages*

Amendment 1: 1994

Amendment 2: 1997

IEC 60364-6:2006, *Electrical installations of buildings – Part 6: Verification*

IEC 60664-1, *Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests*

IEC 60529: 2001, *Degrees of protection provided by enclosures (IP code)*

IEC 61010-1:2001, *Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements*

IEC 61010-2-030, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Special requirements for testing and measuring circuits* [2)]

IEC 61326-2-2:2005, *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*

_____

1) There exists a consolidated edition (6.2), which includes IEC 60038:1983 and its Amendments 1 (1994) and 2 (1997).

2) To be published.

IEC 61326-2-4:2006, *Electrical equipment for measurement, control and laboratory use, - EMC requirements - Part 2: 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*

IEC 61557-2, *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 2: Insulation resistance*

IEC 61557-3, *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 3: Loop impedance*

IEC 61557-4, *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 4: Resistance of earth connection and equipotential bonding*

IEC 61557-5, *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 5: Resistance to earth*

IEC 61557-6, *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 6: Residual current devices (RCD) in TT and TN systems*

IEC 61557-7, *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*

IEC 61557-8, *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 8: Insulation monitoring devices for IT systems*

IEC 61557-9, *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 9: Equipment for insulation fault location in IT systems*

IEC 61557-10, *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 10: Combined measuring equipment for testing, measuring or monitoring of protective measures*

3 Terms and definitions

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

3.1
nominal voltage of the distribution system (U_n)
voltage by which a distribution system or equipment is designated and to which certain operating characteristics are referred

[IEC 60038, Clause 1, modified]

3.2
operating voltage in a system
the value of the voltage under normal conditions, at a given instant and a given point of the system

[IEV 601-01-22, modified]

3.3
voltage against earth
U_o
a) in distribution systems with an earthed neutral point, the voltage between a phase conductor and the earthed neutral point;

b) in all other distribution systems, the voltage present between the remaining phase conductors and earth when one of the phase conductors is shorted to earth

3.4
fault voltage
U_f
voltage appearing under fault conditions between exposed conductive parts (and/or extraneous conductive parts) and earth

3.5
(effective) touch voltage
U_t
voltage between conductive parts when touched simultaneously by a person or an animal

[IEV 826-11-05]

3.6
conventional touch voltage limit
U_L
maximum value of the touch voltage which is permitted to be maintained indefinitely in specified conditions of external influences and is usually equal to 50 V a.c., r.m.s. or 120 V ripple free d.c.

[IEV 826-02-04, modified]

3.7
rated range of voltages
voltage range for which the measuring and monitoring equipment is intended to be used and for which it has been designed

3.8
rated supply voltage
U_S
voltage at a point where the measuring equipment does or can accept electric energy as a supply

3.9
output voltage
U_a
voltage across the measuring equipment terminals where this equipment does or can output electric energy

3.10
open-circuit voltage
U_q
voltage present across unloaded terminals on the measuring equipment

3.11
rated voltage of measuring equipment
U_{ME}
voltage for which the measuring equipment is intended to be used and the value of which is marked on the equipment

3.12
extraneous voltage
voltage to which the measuring equipment can be subjected by external influences. This is not required for the operation of the measuring equipment, but can interfere with its operation

3.13
rated current
I_N
current of the measuring equipment under rated conditions

3.14
short-circuit current
I_k
current flowing across the short-circuited terminals of the measuring equipment

3.15
rated frequency
f_N
frequency for which the measuring equipment is intended to be used and designed

3.16
earth
the conductive mass of the earth whose electric potential at any point is conventionally taken as equal to zero

[IEV 826-04-01]

3.17
earth electrode
a conductive part or group of conductive parts in intimate contact with and providing an electrical connection with earth

[IEV 826-04-02]

3.18
total earthing resistance
R_A
the resistance between the main earthing terminal and the earth

[IEV 826-04-03]

3.19
percentage fiducial uncertainty
(absolute) uncertainty of measuring equipment expressed as a percentage of the fiducial value (see 3.26)

3.20
intrinsic uncertainty
the uncertainty of a measuring instrument or supply instrument when used under reference conditions

[IEC 60359, definition 3.2.10]

NOTE The uncertainty caused by friction is part of the intrinsic uncertainty.

3.21
operating instrumental uncertainty
instrumental uncertainty under the rated operating conditions

[IEC 60359, definition 3.2.11]

NOTE The operating uncertainty will have an extreme value (without regard to sign) at some combination of values of influence quantities within their operating ranges.

3.22
percentage operating uncertainty
operating uncertainty of measuring equipment expressed as a percentage of the fiducial value

3.23
performance characteristic
one of the quantities (described by values, tolerances, ranges) assigned to an equipment in order to define its performance

NOTE Depending on its application, one and the same quantity may be referred to in this standard as a "performance characteristic" and as a "measured or supplied quantity" and also may act as an "influence quantity".

In addition, the term "performance characteristic" includes quotients of quantities, such as voltage per unit of length.

3.24
influence quantity
quantity which is not the subject of the measurement and whose change affects the realationship between the indication and the result of the measurement

[IEC 60359, definition 3.1.14]

NOTE An influence quantity may be external or internal with reference to the equipment. When the value of one of the influence quantities changes within its measuring range, it may affect the uncertainty due to another. The measured quantity or a parameter of it may itself act as an influence quantity. For example, for a voltmeter the value of the measured voltage may produce an additional uncertainty due to non-linearity or its frequency may also cause an additional uncertainty.

3.25
variation (due to an influence quantity)
difference between the indicated values for the same value of the measurand of an indicating instrument, or the values of a material measure, when an influence quantity assumes, successively, two different values

[IEC 60359, definition 3.3.5]

3.26
fiducial value
clearly specified value to which reference is made in order to define the fiducial uncertainty

NOTE This value can be, for example, the upper limit of the measuring range, the scalelength or any other value which is clearly stated

[IEV 311-01-16, modified]

3.27
reference conditions
appropriate set of specified values and/or ranges of values of influence quantities under which the smallest permissible uncertainties of a measuring instrument are specified

[IEC 60359, definition 3.3.10]

3.28
specified operating range
range of values of a single influence quantity which forms a part of the rated operating conditions (see 3.31)

3.29
effect of the supply voltage
effect influencing the functioning of measuring equipment, and consequently the measured value produced by it

3.30
effects of the distribution system voltage
effect influencing the operation and, consequently, the measured value produced by it

3.31
rated operating conditions
set of conditions that must be fulfilled during the measurement in order that a calibration diagram may be valid

[IEC 60359, definition 3.3.13]

3.32
rated measuring voltage
U_M
voltage present at the measuring terminals during the measurement

4 Requirements

Measuring equipment, when used for a designated purpose, shall not endanger persons, livestock or property. Furthermore, measuring equipment with additional functions not forming part of the application of the IEC 61557 series, shall also not endanger persons, livestock or property.

Measuring equipment shall comply with IEC 61010-1 provided nothing to the contrary is specified hereafter.

If the measuring equipment indicates the voltage conditions at its measuring terminals, it must also indicate if the system voltage exists and if the live conductor is exchanged with the protective conductor.

4.1 Operating uncertainty (*B*), percentage operating uncertainty (*B* [%])

The operating uncertainty shall be calculated by means of the following equation:

$$B = \pm\left(|A| + 1{,}15 \times \sqrt{\sum_{i=1}^{N} E_i^2}\right) \quad (1)$$

where

A is the intrinsic uncertainty;

E_i is the variation;

i is the consecutive number of the variations;

N is the number of influencing factors.

The percentage operating uncertainty shall be calculated by means of the following equation:

$$B[\%] = \pm\frac{B}{\text{fiducial value}} \times 100\,\% \quad (2)$$

The influencing variations used for calculating the operating uncertainty are denoted as follows:

– variation due to changing the position E_1

– variation due to changing the supply voltage E_2

– variation due to changing the temperature E_3

– variation due to interference voltages E_4

– variation due to earth electrode resistance E_5

– variation due to changing the phase angle of impedance of circuit under test E_6

– variation due to changing the system frequency E_7

– variation due to changing the system voltage E_8

– variation due to system harmonics E_9

– variation due to system d.c. quantities E_{10}

The permissible percentage operating uncertainties are stated in the other parts of the IEC 61557 series.

NOTE Only one of the influence quantities is varied when calculating the operating uncertainty, whilst the remaining influence quantities are kept under reference conditions. The larger of the respective values of the variation (variation positive and negative) is inserted in the equation for the calculation of the operating uncertainty.

Not all influence quantities are relevant to measuring equipment covered by Parts 2 to 8 of IEC 61557.

Variations measured during type tests can be used in certain cases for calculating the operating uncertainty in routine tests. Details for this are specified in the relevant parts of the IEC 61557 series.

4.2 Rated operating conditions

The stated operating uncertainties shall apply under the following rated operating conditions:

– temperature range from 0 °C to 35 °C;

– a position of ±90° from the reference position for portable measuring equipment;

– 85 % to 110 % of the nominal supply voltage for supply from the distribution systems (if applicable). The values in IEC 60038 shall be used for a supply from the distribution system;

– the charge condition in accordance with 4.3 shall apply to the battery or batteries/ accumulators for measuring equipment with a supply from batteries/accumulators;

– the range of revolutions per minute stated by the manufacturer for measuring equipment with a supply from a hand-driven generator;

– frequency of the supply voltage ±1 % (if applicable).

NOTE Additional rated operating conditions are stated in other parts of the IEC 61557 series.

4.3 Battery check facility

Measuring equipment with power supplied from dry or rechargeable cells shall check that the state of charge of these batteries will permit measurement with specification. This may be done automatically as part of the measurement cycle or as a separate function. The battery should be loaded at least as heavily as during a measurement.

4.4 Terminals

The terminals shall be designed so that the probe assembly can be connected to the measuring equipment reliably and accidental touching of any live parts is impossible.

In this instance, the protective conductor shall be treated as a live part, with the exception of measuring devices covered in IEC 61557-8.

4.5 Class of protection

Measuring equipment shall be designed with double or reinforced insulation (protection class II), with the exception of measuring devices covered in IEC 61557-8 and IEC 61557-9.

4.6 Class of pollution

Measuring equipment shall be designed for at least pollution class 2 in accordance with IEC 61010-1.

4.7 Overvoltage category

Measuring equipment covered by IEC 61557-8 and IEC 61557-9 shall be designed for at least overvoltage category III according to IEC 60664-1.

4.8 Measuring category

Measuring equipment covered by IEC 61557-3, IEC 61557-5, IEC 61557-6, IEC 61557-7 and IEC 61557-10 shall be designed for at least measuring category III according IEC 61010-2-030. Measuring equipment covered by IEC 61557-2, IEC 61557-4, IEC 61557-5 (battery powered) and IEC 61557-4 shall be designed for at least measuring category II.

4.9 Electromagnetic compatibility

4.9.1 Measuring equipment covered by IEC 61557-2, IEC 61557-3, IEC 61557-4, IEC 61557-5, IEC 61557-6, IEC 61557-7 and IEC 61557-10 shall be designed according to IEC 61326-2-2.

4.9.2 Measuring equipment covered by IEC 61557-8 and IEC 61557-9 shall be designed according to IEC 61326-2-4.

4.10 Vibration test

In addition to the mechanical resistance tests in accordance with IEC 61010-1, measuring equipment shall successfully pass the following vibration conditions *(type test):*

– direction: three mutually perpendicular axes;
– amplitude: 1 mm;
– frequency: 25 Hz;
– duration: 20 min.

5 Marking and operating instructions

Marking and operating instructions shall comply with IEC 61010-1 unless otherwise specified in other parts of IEC 61557.

5.1 Marking

The measuring equipment shall carry the following marking which shall be clearly readable and indelible.

5.1.1 Type of equipment.

5.1.2 Units of the measured quantity.

5.1.3 Ranges of measurement.

5.1.4 Type and current rating of the fuse in the case of exchangeable fuses.

5.1.5 Type of battery/accumulator and polarity of connection in the battery compartment.

5.1.6 Nominal voltage of the distribution system and the symbol for double insulation in accordance with IEC 61010-1 for measuring equipment with distribution system power supply.

5.1.7 Manufacturer's name or registered trade mark.

5.1.8 Model number, name or other means to identify the equipment (inside or outside).

5.1.9 Reference to the operating instructions with the symbol  in accordance with IEC 61010-1.

5.2 Operating instructions

The operating uncertainty, the intrinsic uncertainty and the variations E_1 to E_{10} shall be provided in the operating instructions (with the exception of measuring devices covered by IEC 61557-8 and IEC 61557-9).

In addition the operating instructions shall comprise the following details:

5.2.1 Connection diagrams.

5.2.2 Instructions for measurements.

5.2.3 Brief description of the principle of measurement.

5.2.4 Diagrams or tables showing the maximum permissible indicated values taking into consideration the tolerances stated by the manufacturer (if necessary).

5.2.5 Type of battery/rechargeable cells.

5.2.6 Information on the charging current, charging voltage and duration of charging for rechargeable cells.

5.2.7 Operational lifetime/runtime of the battery/rechargeable cells or the possible number of measurements.

5.2.8 Type of IP protection (IEC 60529).

5.2.9 Any necessary special guidance notes.

6 Tests

Measuring equipment shall be tested in accordance with IEC 61010-2-030 and IEC 61326-2-2 unless otherwise specified in the following subclauses or in other parts of IEC 61557 series.

All tests shall be carried out under reference conditions unless otherwise specified. The reference conditions are stated in the various parts of IEC 61557 series.

6.1 Influence of position

The variation E_1 due to changing the position in accordance with 4.2, if applicable, shall be determined for positions +90° or –90° from the reference position stated by the manufacturer *(routine test).*

6.2 Influence of temperature

The variation E_3 due to changing the temperature in accordance with 4.2 shall be determined under the following rated operating conditions:

– at 0 °C and 35 °C after reaching a state of equilibrium *(type test)*.

6.3 Influence of the supply voltage

The variation E_2 due to changing the supply voltage shall be determined under the following rated operating conditions *(routine test):*

– limits in accordance with 4.2 for measuring equipment supplied from distribution systems;

– limits in accordance with 4.3 and 6.4 for measuring equipment supplied from a battery/accumulator;

– limits in accordance with 4.2 for measuring equipment supplied by a hand-driven generator.

6.4 Battery check facility

The lower and upper limits for the battery voltage to which the battery check facility in accordance with 4.3 is set, shall be determined by means of an external voltage source. These values shall be used during the test in accordance with 6.3 as limits for variation E_2 by changing the supply voltage *(routine test).*

6.5 Protection class

Compliance with double or reinforced insulation (protection class II) in accordance with 4.5 shall be checked, with the exception of measuring devices covered by IEC 61557-8 and IEC 61557-9 *(type test).*

6.6 Terminals

Terminals in accordance with 4.4 shall be checked for protection against accidental contact with live parts *(type test).*

6.7 Mechanical requirements

The test shall be executed in accordance with 4.9 *(type test)*.

The tests are deemed to have been passed successfully when no parts have become loose or bent and the connecting leads are not damaged. After the process, the measuring equipment shall comply with the requirements with respect to operating uncertainty in accordance with 4.1 *(type test).*

6.8 Marking and operating instructions

The marking and the operating instructions in accordance with Clause 5 of Parts 1 to 10 of the IEC 61557 series shall be checked by visual inspection *(type test, except correct marking as routine test).*

Bibliography

IEC 60050-300:2001, *International Electrotechnical Vocabulary – Electrical and electronic measurements and measuring instruments – Part 311: General terms relating to measurements*

IEC 60050-601:1985, *International Electrotechnical Vocabulary – Chapter 601: Generation, transmission and distribution of electricity – General*

IEC 60050-826:1982, Amendment 1:1998, *International Electrotechnical Vocabulary – Part 826: Electrical installations of buildings*

IEC 60359:2001, *Expression of the performance of electrical and electronic measuring equipment*

NOTE Harmonized as EN 60359:2002 (not modified).

IEC 60364-1:2001, *Electrical installations of buildings – Part 1: Fundamental principles, assessment of general characteristics, definitions*

IEC 60364-6:2006*, Low electrical installations – Part 6 : Verification*

NOTE Harmonized as HD 60364-6:2007 (modified).

IEC 61326-1:2005, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements*

NOTE Harmonized as EN 61326-1:2006 (not modified).

———————

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60038 (mod) - - A1 A2	1983 - - 1994 1997	IEC standard voltages[1)]	HD 472 S1 + corr. February A1	1989 2002 1995
IEC 60364-6 (mod)	2006	Low voltage electrical installations - Part 6: Verification	HD 60364-6	2007
IEC 60664-1	-[2)]	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2003[3)]
IEC 60529 A1	1989 1999	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May A1	1991 1993 2000
IEC 61010-1	2001	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements	EN 61010-1 + corr. June	2001 2002
IEC 61010-2-030	200X[4)]	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-030: Particular requirements for testing and measuring circuits	-	-
IEC 61326-2-2	2005	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	2006

[1)] The title of HD 472 S1 is: Nominal voltages for low voltage public electricity supply systems.

[2)] Undated reference.

[3)] Valid edition at date of issue.

[4)] To be published.

Publication	Year	Title	EN/HD	Year
IEC 61326-2-4	2006	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	2006
IEC 61557-2	-[2)]	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	EN 61557-2	2007[3)]
IEC 61557-3	-[2)]	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 3: Loop impedance	EN 61557-3	2007[3)]
IEC 61557-4	-[2)]	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 4: Resistance of earth connection and equipotential bonding	EN 61557-4	2007[3)]
IEC 61557-5	-[2)]	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 5: Resistance to earth	EN 61557-5	2007[3)]
IEC 61557-6	-[4)]	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	200X[5)]
IEC 61557-7	-[2)]	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	EN 61557-7	2007[3)]
IEC 61557-8	-[2)]	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	200X[5)]

[5)] To be ratified.

Publication	Year	Title	EN/HD	Year
IEC 61557-9	-[2)]	Electrical safety in low voltage distribution systems up to 1 kV a.c. and 1,5 kV d.c. - Equipment for testing, measuring or monitoring of protective measures - Part 9: Equipment for insulation fault location in IT systems	EN 61557-9	1999[3)]
IEC 61557-10	-[2)]	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 10: Combined measuring equipment for testing, measuring or monitoring of protective measures	EN 61557-10	2001[3)]

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001. Fax: +44 (0)20 8996 7001. Email: orders@bsi-global.com. Standards are also available from the BSI website at http://www.bsi-global.com.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: +44 (0)20 8996 7111. Fax: +44 (0)20 8996 7048. Email: info@bsi-global.com.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: +44 (0)20 8996 7002. Fax: +44 (0)20 8996 7001. Email: membership@bsi-global.com.

Information regarding online access to British Standards via British Standards Online can be found at http://www.bsi-global.com/bsonline.

Further information about BSI is available on the BSI website at http://www.bsi-global.com.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL