



SLOVENSKI STANDARD

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Electronic equipment for use in power installations

Electronic equipment for use in power installations

Ausrüstung von Starkstromanlagen mit elektronischen Betriebsmitteln

Équipement électronique utilisé dans les installations de puissance

Ta slovenski standard je istoveten z: **EN 50178:1997**

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Stabilized power supply

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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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and 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

Foreword

This European Standard was prepared by the Task Force CENELEC BTTF 60-1, Assembly of electronic equipment.

A first draft was submitted to CENELEC enquiry (6MP) in August 1994 but failed to be accepted. A second draft was submitted to CENELEC enquiry (2MP) in September 1995 and was accepted. The text of the final draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50178 on 1997-07-01.

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) 1998-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2003-06-01

Annexes designated "informative" are given for information only. In this standard annexes A and B are informative.

Annex A offers additional information e.g. as a basis for design purposes. It also indicates items where new standards are expected to be established. Functions or characteristics presented in the informative annex A may be used as options of the electronic equipment, provided that test methods are specified and test equipment is available. In any case, these points have to be discussed and clarified between customer and manufacturer.

Annex B is under consideration. It is intended to contain tables with all important figures and values. It shows a condensed overview on the conditions and requirements for convenience of the user of the standard.

The requirements of this European Standard are based on basic or generic standards issued by IEC or CLC where these standards exist. This is valid especially for safety and environmental requirements. Additional requirements are stipulated where necessary.

This European Standard is a harmonized standard for electronic equipment for use in power installations according to the Low Voltage Directive 73/23/EEC. No additional requirements are to be met for compliance with this directive.

Contents

	Page
Foreword.....	2
Introduction.....	10
1 Scope	11
2 Normative references	11
3 Definitions	14
4 Requirements for entire system	21
4.1 Normal function.....	21
4.2 Damage to persons or material.....	21
4.3 EE connected to unearthed supply mains under condition of earth fault.....	22
4.4 Earthing requirements (Grounding, earthing and screening).....	22
4.5 Wires and cables for interconnection.....	22
4.6 Fuses in neutral and protective conductors.....	22
5 Safety requirements	23
5.1 General requirements.....	23
5.2 Requirements for EE with regard to protection against electric shock.....	25
5.2.1 Requirements for protection against electric shock.....	25
5.2.2 Protection against direct contact.....	25
5.2.3 Protection by means of insulation of live parts.....	25
5.2.4 Protection by means of enclosures and barriers.....	27
5.2.4.1 Distances.....	27
5.2.5 Discharge of capacitors.....	28
5.2.6 Built-in devices.....	28
5.2.7 EE for closed electrical operating areas.....	28
5.2.8 Protection in the case of direct contact.....	28
5.2.8.1 Protection by means of extra-low voltage with protective separation (SELV- and PELV-system).....	28
5.2.8.2 Protection by means of limitation of the discharging energy.....	29
5.2.8.3 Protection by means of protective impedance.....	29
5.2.8.4 Protection by using limited voltages in control circuits.....	29
5.2.8.5 Connectors.....	29
5.2.9 Protection with regard to indirect contact.....	30
5.2.9.1 Insulation between live parts and exposed conductive parts.....	30
5.2.9.2 Protective bonding.....	30
5.2.9.3 Rating of protective bonding.....	31
5.2.9.4 Protection against corrosion.....	31
5.2.9.5 Protective bonding conductor with low cross section.....	31
5.2.9.6 EE with voltage above a.c. 1 400 V or d.c. 2 000 V.....	31
5.2.9.7 Interruption.....	31
5.2.9.8 Marking.....	31
5.2.10 Means of connection for the protective conductor.....	32
5.2.11 Leakage current and fault current.....	32
5.2.11.1 High leakage current.....	32
5.2.11.2 Compatibility with residual-current-operated protective devices in case of low leakage current.....	33
5.2.12 Special features in EE for protective class II.....	34
5.2.13 Decisive voltage.....	35
5.2.14 Solid insulation, insulation of circuits.....	38
5.2.14.1 Between circuits and exposed conductive parts or accessible surfaces of EE.....	38
5.2.14.2 Between circuits.....	38
5.2.14.3 Bridging of the insulation via conductive parts.....	39
5.2.15 Clearances and creepage distances, pollution degree.....	39
5.2.15.1 Clearances and creepage distances.....	39
5.2.15.2 Pollution degree.....	46
5.2.16 Clearances.....	46

	Page	
5.2.16.1	Clearances between mains-circuits and their environment.....	47
5.2.16.2	Clearances between non-mains-circuits and their environment.....	49
5.2.16.3	Clearances within a circuit.....	50
5.2.17	Creepage distances.....	52
5.2.18	Protective separation.....	54
5.2.18.1	Constructive measures.....	55
5.2.18.2	Protective separation by double or reinforced insulation.....	56
5.2.18.3	Protective separation by protective screening.....	56
5.2.18.4	Clearances and creepage distances in case of protective separation.....	57
5.2.18.5	Partial discharge.....	57
5.2.18.6	Components and other electrical sub-assemblies.....	58
5.3	Requirements for EEs in installations with regard to protection against electric shock.....	58
5.3.1	Protection with regard to direct contact.....	58
5.3.1.1	Cables and leads.....	58
5.3.1.2	Connection of EE with protective separation.....	58
5.3.1.3	Built-in devices in installations.....	59
5.3.1.4	EE in closed electrical operating areas.....	59
5.3.2	Protection with regard to indirect contact.....	59
5.3.2.1	Leakage current through the protective conductor.....	59
5.3.2.2	Permissible touch voltage.....	60
5.3.2.3	Protection of EE by residual-current-operated protective device.....	60
6	Environmental requirements and conditions.....	60
6.1	Climatic condition.....	60
6.1.1	Temperature.....	62
6.1.1.1	Ambient air temperature.....	62
6.1.1.2	Cooling medium temperature.....	62
6.1.2	Humidity and air pressure.....	62
6.1.3	Pollution.....	62
6.2	Mechanical requirements (general).....	63
6.2.1	Mechanical shock.....	63
6.2.2	Mechanical vibration.....	63
6.2.2.1	Immunity requirement to mechanical vibration.....	63
6.2.2.2	Mechanical vibration emission constraints.....	63
6.2.3	Sealing in case of liquid cooling.....	64
6.2.4	Sealing against dust ingress to EE.....	64
6.3	Electrical and electromagnetic requirements.....	64
6.3.1	Conditions in the system (immunity level for EE).....	64
6.3.2	EE connected to a.c. supply mains (immunity).....	64
6.3.2.1	Supply voltage variation.....	64
6.3.2.2	Frequency.....	65
6.3.3	EE connected to d.c. supply mains (immunity).....	65
6.3.4	Short-circuit withstand capability (immunity).....	65
6.3.5	Immunity from electromagnetic disturbance.....	66
6.3.6	Effects of EE(s) on the system (emission).....	66
6.3.7	Rating of power electronic equipment.....	66
7	Requirements for electronic equipment.....	66
7.1	Design and construction.....	66
7.1.1	General.....	66
7.1.2	Quality and reliability.....	66
7.1.3	Working life.....	67
7.1.4	Insulation.....	67
7.1.5	Component selection and use.....	67
7.1.5.1	Selection criteria for components.....	67
7.1.5.2	Hazards arising from components.....	67
7.1.6	Power supply switching, fusing and usage.....	68
7.1.6.1	Fire protection and fire risk.....	68
7.1.6.2	Operation under fault conditions.....	68
7.1.7	Construction.....	68

	Page
7.1.7.1	EE mounting practice - general..... 68
7.1.7.2	Cooling 68
7.1.7.3	Mechanical protection of equipment and sub-units..... 68
7.1.7.4	Layout of components and equipment..... 69
7.1.7.5	Temperature of accessible parts..... 69
7.1.7.6	Fixing (mechanical retention of components and sub-units)..... 69
7.1.8	Electrical connections..... 69
7.1.9	Multiple connectors and plug-and-socket devices..... 70
7.1.10	Electrical conductors..... 70
7.1.10.1	Wires and cables for interconnection..... 70
7.1.10.2	Conventional wiring within EE..... 70
7.1.11	Reference conductor, functional earthing..... 70
7.2	Marking, identification, documentation..... 70
7.2.1	Marking..... 70
7.2.2	Identification of equipment, sub-units, position and terminals..... 71
7.2.3	Documentation 71
7.2.3.1	General..... 71
7.2.3.2	Operating documents..... 72
7.2.3.3	Instructions for transport, maintenance, fault finding, repair..... 72
7.2.3.4	Test records..... 72
7.2.4	Drawings and diagrams..... 72
8	Requirements for the assembly of EE(s) in power installations..... 73
8.1	General..... 73
8.2	Fitting tolerances after assembly..... 73
8.3	Supply mains..... 73
8.3.1	Monitoring of insulation..... 73
8.3.2	Functional earthing..... 73
8.3.3	Design and protection of conductors to and in EE..... 73
8.3.3.1	Power input conductors to EE..... 73
8.3.3.2	Conductors between separated parts of an EE..... 74
8.3.3.3	Conductors on the load side of EE..... 74
8.3.3.4	Protective conductors..... 74
9	Testing..... 75
9.1	General..... 75
9.1.1	Tests and methods of testing..... 75
9.1.1.1	Type test..... 75
9.1.1.2	Routine test..... 76
9.1.1.3	Sample test..... 76
9.1.1.4	Site test..... 76
9.1.2	General conditions for testing..... 76
9.1.3	Verification procedure..... 77
9.2	Compliance with this European Standard..... 77
9.3	Overview of tests..... 78
9.4	Performance of the tests..... 79
9.4.1	Visual inspections..... 80
9.4.2	Climatic environmental tests..... 81
9.4.2.1	Dry heat test..... 81
9.4.2.2	Damp heat test..... 82
9.4.3	Mechanical tests..... 83
9.4.3.1	Topple test..... 83
9.4.3.2	Vibration test..... 84
9.4.3.3	Seal test for liquid cooled EE..... 84
9.4.4	Safety related mechanical tests..... 84
9.4.4.1	Clearances and creepage distances..... 84
9.4.4.2	Non-accessibility test..... 85
9.4.4.3	Enclosure test..... 85
9.4.4.4	Suitability test of varnish or coating..... 85
9.4.5	Safety related electrical (dielectric) tests..... 85
9.4.5.1	Impulse voltage test..... 86

9.4.5.2	A.C. or d.c. voltage insulation test.....	88
9.4.5.2.1	Relation of a.c. or d.c. test voltage to rated insulation voltage.....	88
9.4.5.2.2	Value and type of insulation test voltage.....	89
9.4.5.2.3	Performing the insulation voltage test.....	91
9.4.5.2.4	Duration and verification of the a.c. or d.c. voltage test.....	92
9.4.5.3	Partial discharge test	92
9.4.5.4	Insulation resistance test in the power installation.....	93
9.4.5.5	Protective impedance, protective screening.....	94
9.4.6	Electrical environmental tests.....	94
9.4.6.1	Emission of electromagnetic disturbance.....	94
9.4.6.2	Immunity from electromagnetic disturbance.....	95
9.4.6.3	Short-circuit withstand capability.....	95
9.4.7	Performance test.....	96

Figures

Figure 1:	Arrangement of fuses in sub-assemblies and in installations.....	23
Figure 2:	Functional summary of protective measures against electric shock.....	24
Figure 3:	Examples for protection against direct contact.....	27
Figure 4:	Flow chart leading to requirements when using EE(s) behind RCD.....	33
Figure 5:	Typical waveform for case a) a.c. voltage.....	35
Figure 6:	Typical waveform for case b) d.c. voltage.....	36
Figure 7:	Typical waveform for case c) pulsating voltage.....	36
Figure 8:	Determination of insulation within a circuit.....	40
Figure 9:	Determination of insulation between live parts and accessible surface.....	41
Figure 10:	Determination of insulation between circuits and environment and of insulation between circuits.....	42
Figure 11:	Determination of functional insulation.....	43
Figure 12:	Determination of basic insulation.....	44
Figure 13:	Determination of double or reinforced insulation.....	45
Figure 14:	Protective separation.....	54
Figure 15:	Clearances and creepage distances for protective separation.....	57
Figure 16:	Voltage test procedures.....	91

Tables

Table 1:	Summary of the limits of the decisive voltage.....	37
Table 2:	Definitions of pollution degrees.....	46
Table 3:	Clearances between mains-circuits and their environment.....	48
Table 4:	Clearances between non-mains-circuits and their environment.....	49
Table 5:	Clearances within a circuit.....	51
Table 6:	Minimum creepage distances.....	53
Table 7:	Climatic conditions.....	61
Table 8:	Heating of accessible parts.....	69
Table 9:	General test conditions.....	77
Table 10:	Overview of tests.....	79
Table 11:	Dry heat test.....	81
Table 12:	Damp heat test.....	82
Table 13:	Tottle test.....	83
Table 14:	Vibration test.....	84
Table 15:	Non-accessibility test.....	85
Table 16:	Impulse voltage test.....	87
Table 17:	Impulse test voltage.....	88
Table 18:	A.C. or d.c. insulation test voltage.....	90
Table 19:	Partial discharge test.....	93
Table 20:	Minimum value of insulation resistance.....	94
Table 21:	Short-circuit withstand capability.....	95

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SIST EN 50178:1999
<https://standards.ifeh.ai/catalog/standards/sisv2a5fb416-1953-4ed7-ab44-2b050338d9b6/sist-en-50178-1999>

ANNEX A (informative)	Additional information.....	97
A.2	Bibliography.....	97
A.4	Requirements for entire system.....	98
A.4.4	Earthing requirements (Grounding, earthing and screening).....	98
A.4.4.1	Functional grounding/earthing.....	98
A.4.4.1.1	Cable screens.....	99
A.4.4.1.2	Armoring, conduits and cable trays.....	99
A.4.4.1.3	Reference conductors.....	100
A.4.4.1.4	Transformer screens.....	100
A.4.4.1.5	Filter returns.....	100
A.4.4.1.6	Radio frequency (RF) screens.....	100
A.4.7	Acoustic noise.....	100
A.5	Safety requirements.....	100
A.5.2.4	Protection by means of enclosures and barriers.....	100
A.5.2.4.2	Mechanical fault.....	101
A.5.2.4.3	Mechanical durability.....	101
A.5.2.4.4	Screws.....	101
A.5.2.4.5	Opening of enclosures.....	101
A.5.2.8	Protection in the case of direct contact.....	102
A.5.2.8.2	Protection by means of limitation of discharging energy.....	104
A.5.2.8.3	Protection by means of protective impedance.....	104
A.5.2.9.2	Bonding connection arrangements.....	104
A.5.2.9.3	Rating of protective bonding.....	105
A.5.2.9.4	Protection against corrosion.....	105
A.5.2.11.2	Compatibility with residual-current-operated protective devices.....	105
A.5.2.13	Decisive voltage.....	107
A.5.2.14.1	Between circuits and exposed conductive parts or accessible surfaces of EE.....	108
A.5.2.16	Clearances.....	110
A.5.2.18	Protective separation.....	111
A.5.2.18.1	Constructive measures.....	111
A.5.2.18.7	Coil devices.....	112
A.5.2.18.8	Switchgear and electromechanical components.....	113
A.5.2.18.9	Semiconductor components and semiconductor configurations.....	114
A.5.2.18.10	Connectors and terminal blocks.....	114
A.5.3	Requirements for EEs in installations with regard to protection against electric shock.....	114
A.5.3.2.4	Equipotential bonding between reference conductor and protective conductor.....	114
A.6	Environmental requirements and conditions.....	115
A.6.1.2	Humidity and air pressure.....	115
A.6.1.3	Pollution (atmospheric).....	115
A.6.1.4	Special stress.....	116
A.6.2.2.1	Immunity requirement to mechanical vibration.....	116
A.6.3	Electrical and electromagnetic requirements.....	116
A.6.3.2	EE connected to a.c. supply mains (immunity).....	116
A.6.3.2.3	Voltage dips and short supply interruptions.....	116
A.6.3.2.4	Harmonic and interharmonic voltages.....	117
A.6.3.2.5	Voltage notches.....	117
A.6.3.2.6	Voltage unbalance.....	117
A.6.3.3	EE connected to d.c. supply mains (immunity).....	118
A.6.3.5	Immunity from electromagnetic disturbance.....	118
A.6.3.5.1	Types of interference.....	118
A.6.3.5.2	Electrical isolation of process I/O and telecommunication ports.....	118
A.6.3.6	Effects of EE(s) on the system (emission).....	118
A.7	Requirements for electronic equipment.....	119
A.7.1.2	Quality and reliability.....	119
A.7.1.5	Component selection and use.....	119

	Page
A.7.1.5.3	Rating..... 119
A.7.1.5.4	Tolerance of components..... 120
A.7.1.5.5	Storage..... 120
A.7.1.5.6	Failure mechanism..... 120
A.7.1.5.7	Semiconductor devices, including integrated circuits..... 120
A.7.1.5.8	Indicating devices..... 120
A.7.1.5.9	Storage / transportation..... 121
A.7.1.6	Power supply switching, fusing and usage..... 121
A.7.1.6.1	Fire protection and fire risk..... 121
A.7.1.6.3	Power supply units..... 121
A.7.1.6.4	Power supply unit usage..... 121
A.7.1.6.5	Batteries 122
A.7.1.7	Construction 122
A.7.1.7.2	Cooling 122
A.7.1.7.7	Component mounting (avoidance of excessive mechanical stressing)..... 122
A.7.1.8	Electrical connections..... 122
A.7.1.8.1	Soldered connections..... 122
A.7.1.8.2	Component soldering..... 122
A.7.1.8.3	Solderless wrapped connections..... 122
A.7.1.8.4	Screwtype connections..... 123
A.7.1.8.5	Current carrying parts and their connections..... 123
A.7.1.8.6	Crimped connections..... 123
A.7.1.8.7	Insulation displacement connections..... 123
A.7.1.8.8	Terminal blocks..... 124
A.7.1.9	Multiple connectors and plug-and-socket devices..... 124
A.7.1.9.1	Printed circuit board connection..... 124
A.7.1.10	Electrical conductors..... 124
A.7.1.10.2	Conventional wiring within EE..... 124
A.7.1.10.3	Materials and finishes..... 125
A.7.1.12	Programmable equipment..... 125
A.7.1.12.1	Software and firmware..... 125
A.7.1.12.2	Software/firmware support..... 126
A.7.2	Marking, identification, documentation..... 126
A.7.2.2	Component identification..... 126
A.7.2.3.5	Documentation for software, firmware and programmable logic..... 126
A.7.2.4	Drawings and diagrams..... 127
A.7.2.4.1	Drawings 127
A.7.2.4.2	Diagrams 127
A.7.3	Setting-up, calibration and maintenance..... 127
A.7.3.1	Objectives..... 127
A.7.3.2	Preset controls and adjustable components..... 127
A.7.3.3	Removal and replacement of sub-units..... 128
A.7.3.4	Test points and other maintenance aids..... 128
A.7.3.5	Special tools..... 128
A.7.3.6	Power sources for test equipment..... 128
A.7.3.7	Loose items..... 128
A.8	Requirements for the assembly of EE(s) in power installations..... 128
A.8.3.3.1	Power input conductors to EE..... 128
A.9	Testing..... 129
A.9.1.1.1	Type test..... 129
A.9.1.1.5	Integration tests..... 129
A.9.4	Additional tests..... 129
A.9.4.2.3	Low temperature test..... 130
A.9.4.2.4	Salt corrosion test..... 130
A.9.4.2.5	Humidity cycling test..... 130
A.9.4.2.6	Mould growth test..... 130
A.9.4.2.7	Industrial atmosphere test..... 130
A.9.4.3.4	Drop test..... 130
A.9.4.3.5	Seismic test..... 130

A.9.4.5.3	Partial discharge test.....	130
A.9.4.6.4	High frequency disturbance test.....	130
A.9.4.6.5	Insulation tests for process I/O and telecommunication ports with electrical isolation.....	131
A.9.4.8	Soak test.....	133

Figures of annex A

Figure A.1:	Examples for protection in the case of direct contact.....	103
Figure A.2:	Fault current in connections with semiconductor devices.....	106
Figure A.3:	Planning example for application of RCD Type B.....	107
Figure A.4:	Examples of subdivided insulation against accessible surfaces of EE.....	108
Figure A.5:	Examples for the insulation of control elements.....	109
Figure A.6:	Examples for the design of clearances.....	110
Figure A.7:	Correlation between humidity and temperature of the air.....	115
Figure A.8:	Periodical momentary dips of a.c. mains voltage caused by convertors.....	117
Figure A.9:	Insulation displacement connection with flat cable.....	123
Figure A.10:	Test set-up for EE grounded via a dedicated earthing connection.....	132
Figure A.11:	Test set-up for EE grounded via power cord.....	132
Figure A.12:	Application of the test voltage to a single port and to grouping of ports.....	133

Tables of annex A

Table A.1:	Values of accessible capacitance and charging voltage.....	104
Table A.2:	Maximum concentration of corrosive gases.....	116

ANNEX B (informative)	Tables and figures.....	134
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Introduction

As the title indicates this European Standard applies where electronic equipment is to be installed or is used in power installations. The term electronic equipment denotes equipment which may contain information technology equipment as well as power electronic equipment and non-electronic components. Electronic equipment may be designed and used as stand-alone-equipment or as sub-assemblies built as cubicles, plug-in-units or assembled printed circuit boards. However the EMC requirements are always to be fulfilled on the apparatus or system level.

The term power installation as used in this European Standard denotes an installation with assembled electrical and electronic equipment in a given location and designed for coordinated operation and connected to an electricity supply system. Although the use of the installation is not specified it is expected that the main purpose will be controlling, regulating and converting electrical energy. In all cases within this European Standard a power installation is interacting with the electricity supply system, either directly e.g. by means of control, regulating and protection system, or indirectly e.g. by means of measurements leading to intervention by personnel. However, power installation as used in other standards may have other definitions.

As the title "Electronic Equipment for Use in Power Installations" implies the standard mainly applies where electronic equipment is integrated into or is used in power installations. As the standard is also concerned with the design and testing of electronic equipment, the appropriate clauses within it apply in cases where no other applicable specifications exist in individual product-standards.

Beyond that the main intention of the standard is to stipulate minimum requirements for the design and manufacture of electronic equipment, for protection against electric shock, for testing and for the integration into systems for power installations. Right from the beginning and reflecting the experiences of the experts it seems necessary to use minimum requirements in order to achieve a certain technical level with respect to safety and reliability. This is especially true where electronic equipment is assembled into power installations.

In all cases where more severe requirements are defined in individual product-standards or purchasing specifications they shall take precedence over the requirements of this European Standard. This may be true for special safety related applications of electronic equipment or applications under special environmental conditions.

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In the other cases where a product-standard does not meet the minimum requirements of this European Standard and therefore prevents the direct use of electronic equipment designed and manufactured fulfilling the requirements of those product-standards additional means has to be considered in power installations. One possibility is to influence the environmental conditions in which the electronic equipment is operating so that they are compatible with the requirements of this European Standard. This can be done by special casing or means of filtering for example. The other possibility is to improve the electronic equipment so that it meets the requirements of this European Standard.

1 Scope

This European Standard applies to the use of electronic equipment (EE) in power installations where a uniform technical level with respect to safety and reliability is necessary. This standard also applies to EE which are not covered by a specific product standard.

This European Standard defines the minimum requirements for the design and manufacture of EE, for protection against electric shock, for testing and its integration into systems for power installations.

This European Standard does not cover the following applications: Electrical accessories and electrical appliances for household and similar purposes, medical equipment, electric railway equipment, data processing without control on systems and processes, public and private non-industrial telecommunication and radio communication equipment and networks, protection relays, residual-current-operated protective devices, uninterruptible power supplies, lighting equipment and public charging equipment for electrical vehicles.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

European Standards

EN 29000	1988	Quality management and quality assurance Guidelines for selection and use
EN 50081-1		Electromagnetic compatibility - Generic emission standard - Part 1: Residential, commercial and light industry
EN 50081-2		Electromagnetic compatibility - Generic emission standard - Part 2: Industrial environment
EN 50082-1		Electromagnetic compatibility - Generic immunity standard - Part 1: Residential, commercial and light industry
EN 50082-2		Electromagnetic compatibility - Generic immunity standard - Part 2: Industrial environment
prEN 50093	1991	Basic immunity standard for voltage dips, short interruptions and voltage variations
EN 60068-2-2	1993	Basic environmental testing procedures - Part 2: Tests
+A1	1993	Tests B: Dry heat (IEC 68-2-2:1974
+A2	1994	+ IEC 68-2-2/A1:1993 + IEC 68-2-2/A2:1994)
EN 60068-2-6	1995	Basic environmental testing procedures - Part 2: Tests Test Fc and guidance: Vibration (sinusoidal) (IEC 68-2-6:1995)
EN 60068-2-31	1993	Basic environmental testing procedures - Part 2: Tests - Test Ec: Drop and topple, primarily for equipment-type specimens (IEC 68-2-31:1969 + A1:1982)
EN 60071-1	1995	Insulation coordination Part 1: Terms, definitions, principle and rules (IEC 71-1:1993)
EN 60146-1-1	1993	Semiconductor convertors - General requirements and line commutated convertors - Part 1-1: Specifications of basic requirements (IEC 146-1-1:1991)
EN 60269-1	1989	Low-voltage fuses - Part 1: General requirements (IEC 269-1:1986)

EN 60352-1	1994	Solderless connections - Part 1: Solderless wrapped connections - General requirements, test methods and practical guidance (IEC 352-1:1983)
EN 60352-2	1994	Solderless connections - Part 2: Solderless crimped connections - General requirements, test methods and practical guidance (IEC 352-2:1990)
EN 60529	1991	Degrees of protection provided by enclosures (IP-Code) (IEC 529:1989)
EN 60721-3-1	1993	Classification of environmental conditions Part 3: Classification of groups of environmental parameters and their severities - Storage (IEC 721-3-1:1987 + A1:1991)
EN 60721-3-2	1993	Classification of environmental conditions Part 3: Classification of groups of environmental parameters and their severities - Transportation (IEC 721-3-2:1985 + A1:1991)
EN 60721-3-3	1995	Classification of environmental conditions Part 3: Classification of groups of environmental parameters and their severities - Stationary use at weatherprotected locations (IEC 721-3-3:1994)
EN 60721-3-4	1995	Classification of environmental conditions Part 3: Classification of groups of environmental parameters and their severities - Stationary use at non-weatherprotected locations (IEC 721-3-4:1995)
EN 61008-1	1994	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB's) - Part 1: General rules (IEC 1008-1:1990 + A1:1992)
EN 61136-1	1995	Semiconductor power converters - Adjustable speed electric drive systems - General requirements - Part 1: Rating specifications, particularly for d.c. motor drives (IEC 1136-1:1992, modified)
EN 61180-1	1994	High-voltage test technique for low-voltage equipment Part 1: Definitions, test and procedure requirements (IEC 1180-1:1992)
EN 61800-3	1996	Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test methods (IEC 1800-3:1996)
ENV 61000-2-2	1993	Electromagnetic compatibility (EMC) Part 2: Environment - Section 2: Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems (IEC 1000-2-2:1990, modified)

Harmonization Documents

HD 21.7 S1	1990	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V - Part 7: Single core non-sheathed cables for internal wiring for a conductor temperature of 90°C
HD 193 S2	1982	Voltage bands for electrical installation of buildings (IEC 449:1973 + A1:1979)
HD 214 S2	1980	Method for determining the comparative and the proof tracking indices of solid insulation materials under moist conditions (IEC 112:1979)
HD 243 S12	1995	Graphical symbols for use on equipment (IEC 417:1973 + IEC 417A:1974 to IEC 417M:1994)
HD 323.2.3 S2	1987	Basic environmental testing procedures - Part 2: Tests - Test Ca: Damp heat, steady state (IEC 68-2-3:1969 + A1:1984)
HD 323.2.28 S1	1988	Basic environmental testing procedures - Part 2: Tests - Guidance for damp heat tests (IEC 68-2-28:1980)

HD 366 S1	1977	Classification of electrical and electronic equipment with regard to protection against electric shock (IEC 536:1976)
HD 384.2 S1	1986	International Electrotechnical Vocabulary (IEV) Chapter 826: Electrical installations of buildings (IEC 50(826):1982)
HD 384.3 S2	1995	Electrical installation of buildings Part 3: Assessment of general characteristics (IEC 364-3:1993, modified)
HD 384.4.41 S2	1996	Electrical installation of buildings Part 4: Protection for safety - Chapter 41: Protection against electric shock (IEC 364-4-41:1992, modified)
HD 384.4.43 S1	1980	Electrical installation of buildings Part 4: Protection for safety - Chapter 43: Protection against overcurrent (IEC 364-4-43:1977, modified)
HD 384.4.47 S2	1995	Electrical installation of buildings Part 4: Protection for safety - Chapter 47: Application of protective measures for safety - Section 470: General - Section 471: Measures of protection against electric shock (IEC 364-4-47:1981 + A1:1993, modified)
HD 384.4.473 S1	1980	Electrical installation of buildings Part 4: Protection for safety - Chapter 47: Application of protective measures for safety - Section 473: Measures of protection against overcurrent (IEC 364-4-473:1977, modified)
HD 384.5.523 S1	1991	Electrical installation of buildings Part 5: Selection and erection of electrical equipment Chapter 52: Wiring systems - Section 523: Current-carrying capacities (IEC 364-5-523:1983, modified)
HD 384.5.54 S1	1988	Electrical installation of buildings Part 5: Selection and erection of electrical equipment - Chapter 54: Earthing arrangements and protective conductors (IEC 364-5-54:1980, modified)
HD 384.6.61 S1	1992	Electrical installation of buildings Part 6: Verification - Chapter 61: Initial verification (IEC 364-6-61:1986, modified)
HD 413.3 S1	1987	Operating conditions for industrial-process measurement and control equipment - Part 3: Mechanical influences (IEC 654-3:1983)
HD 472 S1	1989	Nominal voltages for low voltage public electricity supply systems (IEC 38:1983, modified)
HD 493.1 S1	1988	Dimensions and mechanical structures of 482,6 mm (19 in) series Part 1: Panels and racks (IEC 297-1:1986)
HD 540.2 S1	1991	Insulation co-ordination Part 2: Application guide (IEC 71-2:1976)
HD 540.3 S1	1991	Insulation co-ordination Part 3: Phase-to-phase insulation co-ordination Principle, rules and application guide (IEC 71-3:1982)
HD 588.1 S1	1991	High voltage test techniques - Part 1: General definitions and test requirements (IEC 60-1:1989)
HD 625.1 S1	1996	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests (IEC 664-1:1992, modified)