SLOVENSKI STANDARD
SIST EN 60950:2001

01-december-2001

Nadomešča:
SIST EN 60950:1996/A1:1996
SIST EN 60950:1996/A11:1999
SIST EN 60950:1996/A2:1996
SIST EN 60950:1996/A3:1999
SIST EN 60950:1996/A4:1999

Safety of information technology equipment

Safety of information technology equipment

Sicherheit von Einrichtungen der Informationstechnik

Sécurité des matériels de traitement de l'information

Ta slovenski standard je istoveten z: **EN 60950:2000**

ICS:

35.020	Informacijska tehnika in tehnologija na splošno	Information technology (IT) in general
35.260	Pisarniški stroji	Office machines

SIST EN 60950:2001 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60950

August 1992

UDC 681.3:651.2:620.1:614.8

Supersedes EN 60950:1988 + amendments

Descriptors: Information technology equipment, business equipment, personal computer, safety

English version

Safety of information technology equipment, including electrical business equipment
(IEC 950:1991, modified)

Sécurité des matériels de traitement de l'information, y compris les matériels de bureau électriques
(CEI 950:1991, modifiée)

Sicherheit von Einrichtungen der Informationstechnik, einschließlich elektrischer Büromaschinen
(IEC 950:1991, modifiziert)

This European Standard was approved by CENELEC on 16 June 1992. 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, 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

Following a decision taken by the CENELEC Technical Board at their meeting in London on 23 September 1991, the International Publication IEC 950:1991 was submitted to the CENELEC Unique Acceptance Procedure (UAP) in October 1991 for acceptance as a European Standard.

The reference document, with common modifications as prepared by Reporting Secretariat SR 74, was approved by CENELEC as EN 60950 on 16 June 1992.

The following dates were fixed:

- latest date of publication of an identical national standard	(dop)	1993-03-01
- latest date of withdrawal of conflicting national standards	(dow)	1995-03-01

For products which have complied with EN 60950:1988 and its amendments A1:1990 and A2:1991 before 1995-03-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2000-03-01.

Annexes designated "normative" are part of the body of the standard. Annexes designated "informative" are given only for information. In this standard annexes ZA and ZB are normative and annex ZC is informative.

Endorsement notice

The text of the International Standard IEC 950:1991 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

1 General

1.2.8.8 **Add**:

A TNV circuit is considered to be a secondary circuit in the meaning of 1.2.8.2 of this standard.

1.7.2 **Delete** note 4.

1.7.11 **Replace** "2.7.2" by "2.7".

2 Fundamental design requirements

2.1.3 In line 1, **replace** "external" by "internal".

2.3.3 **Delete** Method 4 and the line in note 1 relating to this method.

2.3.6 **Delete** the note.

2.3.7 **Replace** the text of this subclause by:

Void.

2.5.2 **Delete** the note.

2.7.1 **Replace** the text of this subclause by:

2.7.1 *Basic requirements*

To protect against excess current, short circuits and earth faults in primary circuits, protective devices shall be included either as integral parts of the equipment or as a part of the building installation, subject to all of the following, a), b) and c):

a) Except as detailed in b), protective devices necessary to comply with the requirements of 5.4 shall be included as integral parts of the equipment.

b) For components in series with the mains input to the equipment such as the supply cord, appliance coupler, RFI filter and switch, short circuit and earth fault protection may be provided by protective devices in the installation.

c) If reliance is placed on protection in the building installation, the installation instructions shall comply with 1.7.11 except that for pluggable equipment Type A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet and 1.7.11 does not apply.

2.7.2 **Replace** the text of this subclause by:

Void.

2.8.4 **Delete** the note.

2.11 **Delete** notes 1,2 and 3.

3 Wiring, connections and supply

3.2.2 **Delete** the note and in table 10, **delete** the values in parentheses.

3.2.4 **Replace**
"245 IEC 53" by "H05 RR-F",
"227 IEC 52" by "H03 VV-F or H03 VVH2-F" and
"227 IEC 53" by "H05 VV-F or H05 VVH2-F2".

In Table 11, **replace** the first four lines by the following:

	Up to and including 6	0,75 [1)]
Over 6	up to and including 10	1,0
Over 10	up to and including 16	1,5

In the conditions applicable to table 11, **delete** the words "in some countries" in condition 1 and **delete** conditions 2 and 3.

Delete the note.

3.3.5 In table 13, **replace** the fourth and the fifth lines by:

Over 10	up to and including 16	1,5 to 2,5	1,5 to 4

4 Physical requirements

4.4.4 Delete note 2.

6 Connection to telecommunication networks

6.2.1.1 **Add** at the end of the subclause:

In the event of a single insulation fault or component failure TNV circuits shall not exceed the limits of figure 15.

6.2.1.2 and 6.2.1.3 **Add** at the end of each subclause:

This subclause only applies to TNV circuits normally operating in excess of the limits of SELV circuits.

6.2.1.4 **Delete** the notes.

6.3.3 In the second paragraph, **replace** "for functional reasons" by "to enable the equipment to function".

6.4.1 **Delete** note 2.

6.4.2.1 **Delete** note 2.

Annex P Normative references

Replace the text of this annex by:

See annex ZA.

Annex Q Bibliography

Add for IEC 529:

NOTE: Endorsed by EN 60529:1991 (not modified)

Add for IEC 707:

NOTE: Endorsed by HD 441:1983 (not modified)

Add for IEC 1058-1:

NOTE: Endorsed by EN 61058-1:1992 (not modified)

Annex ZA (normative)

Other international publications quoted in this standard with the references of the relevant European publications

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

IEC Publication	Date	Title	EN/HD	Date
65 (mod)	1985	Safety requirements for mains operated electronic and related apparatus for household and similar general use	HD 195 S6	1989
73	1984	Colours of indicator lights and push-buttons	HD 354 S2	1987
83	1975	Plugs and socket-outlets for domestic and similar general use	—	—
85	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990
112	1979	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions	HD 214 S2	1980
227 (mod)	series	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V	HD 21	series
245 (mod)	series	Rubber insulated cables of rated voltages up to and including 450/750 V	HD 22	series
309 (mod)	1988	Plugs, socket-outlets and couplers for industrial purposes	EN 60309	1992
320 (mod)	1981	Appliance couplers for household and similar general purposes	EN 60320-1 *	1987
364	series	Electrical installation of buildings	HD 384	series
384-14	1981	Fixed capacitors for use in electronic equipment Part 14: Sectional specification: Fixed capacitors for radio interference suppression - Selection of methods of test and general requirements	—	—
417	1973	Graphical symbols for use on equipment Index, survey and compilation of the single sheets	HD 243 S1 *	1975
664	1980	Insulation co-ordination within low-voltage systems including clearances and creepage distances for equipment	—	—
695-2-2	1980	Fire hazard testing - Needle-flame test	HD 444.2.2 S1	1983

* EN 60320-1 includes A1:1984 + A2:1985 to IEC 320; A3:1987 was endorsed by EN 60320-1:1987/A3:1989.

HD 243 S1 is superseded by HD 243 S9:1991 which is based on IEC 417:1973 + supplements A:1974 to J:1990

IEC Publication	Date	Title	EN/HD	Date
825 (mod)	1984	Radiation safety of laser products, equipment classification, requirements and user's guide	HD 482 S1 *	1988
885-1	1987	Electrical test methods for electric cables Part 1: Electrical tests for cables, cords and wires for voltages up to and including 450/750 V	—	—
ISO Publication				
ISO 216	1975	Writing paper and certain classes of printed matter - Trimmer sizes - A and B series	EN 20216	1990
ISO 261	1973	ISO General purpose metric screw threads General plan	—	—
ISO 262	1973	ISO General purpose metric screw threads Selected sizes for screws, bolts and nuts	—	—
ISO 3864	1984	Safety colours and safety signs	—	—
ISO 4046	1978	Paper, board, pulp and related terms Vocabulary	—	—
ISO 7000	1984	Graphical symbols for use on equipment Index and synopsis	—	—
Other Publications				
EN 41003	1991	Particular electrical safety requirements for equipment to be connected to telecommunication networks		

CFR 47, Part 68 — Code of Federal Regulations (USA) Part 68: Connection of terminal equipment to the telephone network (commonly referred to as "FCC Rules, part 68")

73/23/EEC — Council Directive of 19 February 1973 on the harmonization of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits (Low Voltage Directive)

* HD 482 S1 is superseded by EN 60825:1991 which includes A1:1990 to IEC 825

Annex ZB (normative)

Special national conditions

Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions. If it affects harmonization, it forms part of the European Standard.

For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.

Clause	Special national condition
1.2.4.1	In **Denmark**, certain types of Class I appliances (see subclause 3.2.1) may be provided with a plug not establishing earthing continuity when inserted into Danish socket-outlets.
1.7.1	In the **United Kingdom**, marking shall refer to 240 V or 415 V, these being the voltages of the public supply system.
1.7.2	In **Norway**, if separation between the mains and a communication system/network, other than public telecommunications networks, relies upon connection to safety earth, the equipment shall have a marking stating that it must be connected to an earthed mains socket-outlet. NOTE: For requirements for equipment to be connected to a public telecommunication network see 6.2.1.4. In **Sweden**, if the separation between the mains and a SELV terminal relies upon connection to the safety earth, the apparatus shall have a marking stating that it must be connected to an earthed mains socket-outlet when a SELV-circuit is connected to a network passing both unearthed and earthed electrical environment. The marking text shall be in Swedish and as follows: "Apparaten skall anslutas till jordat uttag när den ansluts till ett nätverk."
1.7.5	In **Denmark**, socket-outlets for providing power to other appliances shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on appliances of Class I.
2.3.6	In **Denmark, Finland and France**, Method 3 is not acceptable.
2.5.2	In **Denmark**, the first sentence is replaced by the following: Class II equipment shall have no provision for protective earthing, except that permanently connected equipment may be provided with a means for maintaining the continuity of protective earthing circuits to other equipment in a system, if the earth connection is separated from parts at hazardous voltages by double or reinforced insulation.

3.2.1 In **Denmark**, supply cords of single-phase appliances having a rated current not exceeding 10 A shall be provided with a plug according to the following table:

Class		Plug Section 107-2-D1 Standard Sheet
I	Protection against indirect contact required *)	DK 2-1a or DK 2-5a
	Earthing connection not required	DK 2-1a, DK 2-5a, DKA 2-1a, DKA 2-1b, C 1b, C 2b, C 3b, C 4
II		DK 2-5a**), DKA 2-1a, DKA 2-1b, C 1b, C 5, C 6

*) - Appliances fitted with a socket-outlet for providing power to other appliances.

- Appliances covered by the general requirement for protection against indirect contact in Section 10, clause 18.1.

- Appliances which are mainly used in locations where protection against indirect contact is required, cf. Section 10, clause 17.

**) The earthing contact not connected.

If poly-phase appliances and single-phase appliances having a rated current exceeding 10 A are provided with a supply cord with a plug, this plug shall be in accordance with the following table:

Class of equipment	Plug	
	The Heavy Current Regulations Section 107-1-D1, Standard Sheet	The Heavy Current Regulations Section 117, Standard Sheet
I	DK 6-1a	II
II	DK 6-1a *)	II *)
III	—	IX

*) The earthing contact not connected.

3.2.1 In **Switzerland**, plugs for connection of the power supply cord to primary power have to comply with SEV/ASE 1011.

3.2.4 In the **United Kingdom**, a power supply cord with conductor of 1,25 mm^2 is allowed for equipment with a rated current over 10 A and up to and including 13 A.

3.3.5 In the **United Kingdom**, the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current of over 10 A up to and including 13 A is:

- 1,24 mm^2 to 1,5 mm^2 nominal cross-sectional area.

5.1 In **Norway**, to prevent fire risk, temperature rise limits for wooden supports shall be taken into account.

The temperature rise limit is 65K in general and 60K for equipment for continuous operation.

5.4.1 In **Denmark**, circuits which under fault conditions may cause an earth-leakage current having a d.c. content exceeding 20 % of the total earth-leakage current and also exceeding 5 mA, shall be so constructed that the earth-leakage current can occur only when an insulation fault equivalent to failure of double or reinforced insulation occurs.

Compliance is checked by inspection and measurement.

6.1 In **Switzerland**, protective means in the equipment shall not prevent transient surge protection in the telecommunication network from operating properly (d.c. spark-over voltage of the surge suppressor installed in the telecommunication network: approx. 245 V).

6.2.1.4b) In **Finland**, this method is only permitted for permanently connected equipment or for pluggable equipment type B.

In **Norway**, insulation between parts conductively connected to the supply mains and parts connected to a public telecommunication network shall comply with the requirements for double or reinforced insulation.

6.4.1 In **Finland**, for pluggable equipment it is forbidden to use surge suppressors between the telecommunication network and conductive metallic parts which are permitted to be accessible.

Annex ZC (Informative)

A-Deviations

A-deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CENELEC member.

This European Standard falls under Directive 73/23/EEC.

NOTE (from CEN/CENELEC IR Part 2, 3.1.9): Where standards fall under EC Directives, it is the view of the Commission of the European Communities (OJ No C 59, 9.3.1982) that the effect of the decision of the Court of Justice in case 815/79 Cremonini/Vrankovich (European Court Reports 1980, p. 3583) is that compliance with A-deviations is no longer mandatory and that the free movement of products complying with such a standard should not be restricted except under the safeguard procedure provided for in the relevant Directive.

A-deviations in an EFTA-country are valid instead of the relevant provisions of the European Standard in that country until they have been removed.

Clause	Deviation
1.1.3	**Switzerland** (Swiss Telecommunications law SR 784.10) This standard applies also to all equipment designed and intended to be connected to a telecommunication network terminal.
1.5.1	**Sweden** (Ordinance SFS 1991:1290) Add the following: NOTE: Switches containing mercury such as thermostats, relays and level controllers are not allowed.
1.7.2	**Denmark** (Heavy Current Regulations) Supply cords of Class I appliances, which are delivered without a plug, must be provided with a visible tag with the following text: "Vigtigt! Lederen med grøn/gul isolation må kun tilsluttes en klemme mærket ⏚ eller ⏚ " If essential for the safety of the appliance, the tag must in addition be provided with a diagram, which shows the connection of the other conductors, or be provided with the following text: "For tilslutning af de øvrige ledere, se medfølgende installationsvejledning." **United Kingdom** (Statutary Instrument 931:1977) Power supply cords of Class I equipment must be provided with a label with the following text in legible characters: IMPORTANT The cores in this mains lead are coloured in accordance with the following code: - green and yellow: earth - blue: neutral - brown: live

1.7.5 **Denmark** (Heavy Current Regulations)

Class II appliances shall not be fitted with socket-outlets for providing power to other appliances.

1.7.14 **Germany** (Gesetz über technische Arbeitsmittel (Gerätesicherheitsgesetz) [Law on technical labour equipment (Equipment safety law)], of 24th June 1968 in the version of 18 February 1986, Article 3, 3rd paragraph, 2nd sentence, together with the "Allgemeine Verwaltungsvorschrift zum Gesetz über technische Arbeitsmittel" [General administrative regulation on the law on technical labour equipment)], Article 2, 2nd paragraph, item 2.)

Directions for use with rules to prevent certain hazards for (among others) maintenance of the technical labour equipment, also for imported technical labour equipment shall be written in the German language.

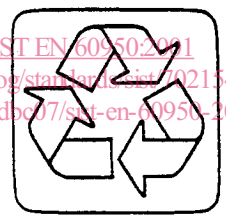
NOTE: Of this requirement, rules for use even only by service personnel are not exempted.

1.7.17 **Switzerland** (Ordinance on environmentally hazardous substances SR 814.013)

Annex 4.10 of SR 814.013 applies for batteries.

1.7.18 **Sweden** (Ordinance SFS 1989:974)

Equipment provided with built-in batteries, not replaceable by the user, shall be marked with the following symbol if the batteries have a content of mercury or cadmium exceeding 0,025 % by weight.



2.8.4 + 2.8.5 **United Kingdom** (Health and Safety Executive Directive)

In the UK, authorities responsible for legislation dealing with protection of personnel from exposure to hazards have a particular interpretation of the expression "extreme hazard". Reference to these authorities is essential.

2.11 **Denmark** (Heavy Current Regulations)
Finland (Decree N° 205/74)

A limited power source shall incorporate an isolating transformer and shall comply with the following:

- the open-circuit voltage shall not exceed 42,4 V peak d.c. and shall not generate voltages above that value;
- the current which may be drawn for more than two minutes at any load, including short circuits, shall not exceed 0,2 A.

Norway (National Building Installation Specification - Feb. 1991)

Table 8 - Limits for inherently limited power sources

In Norway, the maximum value of VA for values of U_{oc} exceeding 10 V is 50.

Table 9 - Limits for power sources not inherently limited (overcurrent protective device required)

In Norway, the maximum value of VA is 50.

5.4.9 **Norway** (National Building Installation Specification - Feb. 1991)

The electric strength test after the tests of 5.4.4, 5.4.5, 5.4.6, 5.4.7 and 5.4.8 includes testing of basic insulation in Class I equipment.

6.3 **Norway** (Telegrafloven av 29. April 1899)

Dielectric barrier between telecom line terminals and mains terminals:

Impulse voltage resistibility

To ensure that the equipment can resist high voltage surges which may arise on power conductors from lightning, the equipment must provide an adequate electrical separation between the port provided for connection of the telecommunication network conductors and the mains terminals.

Compliance shall be checked by applying to the electrical separation 10/700 µs test impulses (using the impulse generating circuit given in Figure N.1) with a test voltage of

- U_c = 10 kV for power distribution systems where no surge suppressor is installed ("uncontrolled" situation, see IEC 664)
- U_c = 2,5 kV for power distribution systems where surge suppressors are installed.

Ten impulses shall be applied with minimum 10 s between consecutive impulses, the polarity being reversed between the impulses.

During the test breakdown through the insulation (with damage of it) shall not occur.

Compliance is checked by subjecting the insulation to an insulation resistance test where the insulation resistance shall not be less than 4 MΩ when measured at 500 V d.c.

6.4.2.1 **Austria** (Fernmeldebauvorschrift Teil 11)

Equipment shall comply with U_c = 2,0 kV in cases b) and c).

Annex H **Germany** (Regulation on protection against hazards by X-ray, of 8th January 1987, Article 5 (Operation of X-ray emission source), Clauses 1 to 4)

a) A licence is required by those who operate an X-ray emission source.

b) A licence in accordance with clause 1 is not required by those who operate an X-ray emission source on which the electron acceleration voltage does not exceed 20 kV if

   1) The local dose rate at a distance of 0,1 m from the surface does not exceed 1 µSv/h and

   2) it is adequately indicated on the X-ray emission source that

      i) X-rays are generated and

      ii) the electron acceleration voltage must not exceed the maximum value stipulated by the manufacturer or importer.

c) A licence in accordance with clause 1 is also not required by persons who operate an X-ray emission source on which the electron acceleration voltage exceeds 20 kV if

1) the X-ray emission source has been granted a type approval and

2) it is adequately indicated on the X-ray emission source that

i) X-rays are generated,

ii) the device stipulated by the manufacturer or importer guarantees that the maximum permissible local dose rate in accordance with the type approval is not exceeded and

iii) the electron acceleration voltage must not exceed the maximum value stipulated by the manufacturer or importer.

d) Furthermore, a licence in accordance with clause 1 is also not required by persons who operate X-ray emission sources on which the electron acceleration voltage does not exceed 30 kV if

1) the X-rays are generated only by intrinsically safe CRTs complying with Enclosure III, no. 6,

2) the values stipulated in accordance with Enclosure III, No. 6.2 are limited by technical measures and specified in the device and

3) it is adequately indicated on the X-ray emission source that the X-rays generated are adequately screened by the intrinsically safe CRT.