



SLOVENSKI STANDARD

SIST HD 366 S1:2001

01-februar-2001

Klasifikacija električne in elektronske opreme glede na zaščito pred električnim udarom

Classification of electrical and electronic equipment with regard to protection against electric shock

Einteilung der elektrischen und elektronischen Betriebsmittel im Hinblick auf den Schutz gegen elektrische Schlag

Classification des matériels électriques et électroniques en ce qui concerne la protection contre les chocs électriques

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Ta slovenski standard je istoveten z: HD 366 S1:1977

ICS:

13.260	Varstvo pred električnim udarom. Delo pod napetostjo	Protection against electric shock. Live working
91.140.50	Sistemi za oskrbo z elektriko	Electricity supply systems

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RD: IEC 536 (1976) ed 1; IEC/TC 64 (not appended)

The Harmonization Document consists of the following:

- Title Page Related to Directive: -

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LIST OF NATIONAL STANDARDS IS GIVEN OVERLEAF

- AT :
- BE : NOS
- CH :
- DE : DIN VDE 0106 Teil 1/05.82
- DK : NOS
- ES : UNE 50 550-79
- FI : SFS 4013 (1983)
- FR : NF C 20-030 (1969) + Add. 1
- GB : BS 2754 : 1976 + Amdt 1
- GR :
- IE :
- IT : NOS
- LU :
- NL :
- NO :
- PT :
- SE : SS 421 21 20 (1978)

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

(affiliée à l'Organisation Internationale de Normalisation — ISO)

RAPPORT DE LA CEI

INTERNATIONAL ELECTROTECHNICAL COMMISSION

(affiliated to the International Organization for Standardization - ISO)

IEC REPORT

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1976

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

CLASSIFICATION OF ELECTRICAL AND ELECTRONIC EQUIPMENT
WITH REGARD TO PROTECTION AGAINST ELECTRIC SHOCK

FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE

At its meeting held in Venice in May 1963, the Advisory Panel on Safety Matters (APSM) adopted a draft on definitions concerning the classification of electrical equipment with regard to precautions against electric shock and definitions related therewith, which had already been accepted by the International Commission on Rules for the Approval of Electrical Equipment (CEE).

In accordance with the decision of the Committee of Action taken in Venice in 1963, this draft was circulated to all IEC National Committees for comments in December of the same year. These comments were considered at the APSM meetings held in Aix-les-Bains (May 1964), in Paris (December 1964) and in Tel-Aviv (October 1966) and as a result a second draft was prepared in June 1967. In January 1968, this draft was circulated under the reference 02(Central Office)70 to all National Committees for comments.

At its meeting held in November 1969, the Committee of Action decided to transform the APSM into the Advisory Committee on Safety (ACOS), consisting of the Chairmen and Secretaries of those IEC Technical Committees which deal with safety.

Comments from National Committees on the draft classification were then considered by ACOS at its meetings held in Washington (May 1970), in Geneva (December 1970), in Brussels (June 1971) and in Baden-Baden (April 1972).

A third draft was prepared, Document ACOS(Central Office)13, which was discussed at the ACOS meeting held in Geneva in January 1973. At its meeting held in Munich in June 1973, the Committee of Action decided to invite the CEE to participate in the consideration of the draft classification of electrical and electronic equipment with regard to protection against electric shock.

The enlarged meetings of ACOS, in which, in addition to ACOS members and CEE representatives, experts of those National Committees which had submitted comments participated, were held in Geneva (January 1974) and in London (June 1974). As a result, a final text of the draft, Document 01(Central Office)523, was submitted to National Committees for approval under the Six Months' Rule in October 1974.

The following countries voted explicitly in favour of publication:

Belgium	Poland
Canada	Romania
Finland	South Africa (Republic of)
France	Spain
Germany	Sweden
Hungary	Switzerland
India	Turkey
Italy	Union of Soviet Socialist Republics
Japan	United Kingdom
Netherlands	United States of America
Norway	Yugoslavia

This publication has the status of an IEC report.

Other IEC publication quoted in this publication:

Publication No. 529: Classification of Degrees of Protection Provided by Enclosures.

CLASSIFICATION OF ELECTRICAL AND ELECTRONIC EQUIPMENT WITH REGARD TO PROTECTION AGAINST ELECTRIC SHOCK

INTRODUCTION

This report is intended to give guidance to IEC Technical Committees on the classification of low-voltage electrical and electronic equipment intended for connection to an external power supply, with regard to protection against electric shock in the event of an insulation failure. According to this classification, this protection may be provided by the environment, by the equipment itself or by the system of supply, and these aspects are summarized in Table I of the Appendix.

Protection with regard to other aspects is covered in other international standards, for example degrees of protection by enclosures are given in IEC Publication 529, Classification of Degrees of Protection Provided by Enclosures.

This report is based upon experience with voltages up to 440 V r.m.s. between phases and 250 V r.m.s. between phases and earth in equipment designed for the purposes detailed in Clause 1. The Technical Committees may, however, consider the possibility of using it for higher voltages and other purposes.

Attention is drawn to the fact that the classification and the related definitions have been carefully co-ordinated and although only parts may be necessary for a particular Technical Committee's work, such parts as are used should not be altered in introducing them into IEC standards.

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1. Scope

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This report describes a classification, with definitions, for means of protection against electric shock in the event of failure of the insulation. It does not detail the requirements for design, construction and testing according to this system.

This classification applies to electrical and electronic equipment (but not the components thereof) intended for connection to an external power supply at system voltages not exceeding 440 V r.m.s. between phases (250 V r.m.s. between phases and earth), for use by the general public in homes, offices, workshops, schools, farms and the like, and for medical and dental purposes.

Open-type equipment, that is to say equipment which does not of itself provide the required degree of protection against contact with live parts,* is not covered.

2. Definitions

2.1 Basic insulation

Insulation applied to live parts to provide basic protection against electric shock.

Note. — Basic insulation does not necessarily include insulation used exclusively for functional purposes.

2.2 Supplementary insulation

Independent insulation applied in addition to basic insulation in order to provide protection against electric shock in the event of a failure of basic insulation.

* This term is under consideration by ACOS.

2.3 Double insulation

Insulation comprising both basic insulation and supplementary insulation.

2.4 Reinforced insulation

A single insulation system applied to live parts, which provides a degree of protection against electric shock equivalent to double insulation under the conditions specified in the relevant IEC standard.

Note. — The term “insulation system” does not imply that the insulation must be one homogeneous piece. It may comprise several layers which cannot be tested singly as supplementary or basic insulation.

2.5 Safety impedance

An impedance connected between live parts and accessible conductive parts, of such value that the current, in normal use and under likely fault conditions in the equipment, is limited to a safe value, and which is so constructed that the reliability is maintained throughout the life of the equipment.

Note. — Details of the likely fault conditions, the safe current and the requirements for reliability are as given in the relevant IEC standards.

2.6 Safety extra-low voltage (SELV)

A voltage which does not exceed 50 V a.c. r.m.s. (see Note 1) between conductors, or between any conductor and earth, in a circuit which is isolated from the supply mains by means such as a safety isolating transformer or converter with separate windings.

Notes 1. — The d.c. value is under consideration.

2. — Limitation to voltages lower than 50 V a.c. r.m.s. may be specified in the particular IEC standard, especially when direct contact with live parts is involved.
3. — The voltage limit should not be exceeded either at full load or no-load, but it is assumed, for the purpose of this definition, that any transformer or converter is operated at its rated supply voltage.

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3. Classes of equipment

The class numbers are not intended to reflect the safety level of the equipment, but only the means by which the safety is obtained.

3.1 Class 0 equipment

Equipment in which protection against electric shock relies upon basic insulation; this implies that there are no means for the connection of accessible conductive parts, if any, to the protective conductor in the fixed wiring of the installation, reliance in the event of a failure of the basic insulation being placed upon the environment.

3.2 Class I equipment

Equipment in which protection against electric shock does not rely on basic insulation only, but which includes an additional safety precaution in such a way that means are provided for the connection of accessible conductive parts to the protective (earthing) conductor in the fixed wiring of the installation in such a way that accessible conductive parts cannot become live in the event of a failure of the basic insulation.

Notes 1. — For equipment intended for use with a flexible cord or cable, this provision includes a protective conductor as part of the flexible cord or cable.

2. — Where equipment designed as Class I is allowed by a Technical Committee to be fitted with a two-core flexible cord or cable provided that it is fitted with a plug which cannot be introduced into a socket outlet with earthing contact, the protection is then equivalent to that of Class 0, but the earthing provisions of the equipment in all other respects should fully comply with the requirements of Class I.

3.3 Class II equipment

Equipment in which protection against electric shock does not rely on basic insulation only, but in which additional safety precautions such as double insulation or reinforced insulation are provided, there being no provision for protective earthing or reliance upon installation conditions.

- Notes 1.* — In certain special cases, such as the signal terminals of electronic equipment, safety impedance may be used in Class II equipment where the competent Technical Committee is satisfied that the safety impedance is necessary and that the technique may be included without detriment to the safety level.
2. — Class II equipment may be provided with means for maintaining the continuity of protective circuits, provided that such means are within the equipment and are insulated from accessible surfaces according to the requirements of Class II.
 3. — In certain cases, it may be necessary to distinguish between “all insulated” and “metal-encased” Class II equipment.
 4. — Metal-encased Class II equipment may be provided with means for the connection of a potential equalization conductor to the enclosure only where such a need is recognized in the relevant IEC standard.
 5. — Class II equipment may be provided with means for connection to earth for functional (as distinct from protective) purposes only where such a need is recognized in the relevant IEC standard.

3.4 Class III equipment

Equipment in which protection against electric shock relies on supply at safety extra-low voltage (SELV) and in which voltages higher than those of SELV are not generated.

- Notes 1.* — Class III equipment should not be provided with means for protective earthing.
2. — Metal-encased Class III equipment may be provided with means for the connection of a potential equalization conductor to the enclosure only where such a need is recognized in the relevant IEC standard.
 3. — Class III equipment may be provided with means for connection to earth for functional (as distinct from protective) purposes only where such a need is recognized in the relevant IEC standard.

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