



**SLOVENSKI STANDARD**  
**SIST HD 193 S2:2000**

**01-februar-2000**

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Voltage bands for electrical installations of buildings (IEC 60449:1973 + A1:1979)

Spannungsbereiche für elektrische Installationen von Gebäuden

Domaines de tensions des installations électriques des bâtiments

**Ta slovenski standard je istoveten z: HD 193 S2:1982**

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**ICS:**

91.140.50 Sistemi za oskrbo z elektriko Electricity supply systems

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VOLTAGE BANDS FOR  
ELECTRICAL INSTALLATION OF BUILDINGS

Domaines de tensions des  
installations électriques des  
bâtiments

Spannungsbereiche für elektrische  
Anlagen von Gebäuden

BODY OF HD

The Harmonization Document consists of:

- IEC 449 (1973) edition 1 with Amendment No. 1 (1979), not appended

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This Harmonization Document was approved by CENELEC on 19 September 1980

The English and French versions of this HD are provided by the text of the IEC publication and the German version is the official translation of the IEC text. According to the CENELEC Internal Regulations the CENELEC member National Committees are bound:

to announce the existence of this Harmonization Document at national level

by or before 1982-04-01

to publish their new harmonized national standard

by or before 1982-10-01

to withdraw all conflicting national standards

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Harmonized national standards are listed on the HD information sheet, which is available from the CENELEC National Committees or from the CENELEC General Secretariat.

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE  
(affiliée à l'Organisation Internationale de Normalisation — ISO)  
RECOMMANDATION DE LA CEI

INTERNATIONAL ELECTROTECHNICAL COMMISSION  
(affiliated to the International Organization for Standardization — ISO)  
IEC RECOMMENDATION

Publication 449  
Première édition — First edition  
1973

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## VOLTAGE BANDS FOR ELECTRICAL INSTALLATIONS OF BUILDINGS

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### INTRODUCTION

The installation rules, especially the measures to be applied for protection against electric shock, depend on the value of the voltage used. Since it is neither possible nor necessary to consider each individual voltage value occurring in practical application, common requirements are established for each particular voltage band. This recommendation is intended to furnish the basis for the uniform fixing of such voltage bands.

Within the field of the installations to which IEC Technical Committee No. 64 recommendations are applicable (see Sub-clause 1.2 of IEC Publication 364-1, Electrical Installations of Buildings, Part 1, Scope, Object and Definitions), it is possible to define two voltage bands which are covered respectively by their own rules.

Some of the conditions to be prescribed may, however, vary as a function of the voltage even within the same voltage band. It is therefore necessary to introduce additional limits for particular applications or installations (e.g. welding, electroplating, etc.). It is assumed, however, that this applies only to a few of the requirements to be fixed. Such specific voltage limits are given in the relevant requirements.

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#### *Band I*

Band I covers:

- installations where protection against shock is provided under certain conditions by the value of voltage;
- installations where the voltage is limited for operational reasons (e.g. telecommunications, signalling, bell, control and alarm installations).

#### *Band II*

Band II contains the voltages for supplies to household, commercial and industrial installations.

This band contains all the voltages of public distribution systems in the various countries.

### 1. Scope

This recommendation applies to a.c. electrical installations of buildings supplied at a frequency not exceeding 60 Hz and at a nominal voltage up to and including 1 000 V.

The voltage bands defined are intended mainly for use in connection with installation rules, but may also be used when preparing requirements for electrical equipment.

*Notes 1.* — The extension of the scope to include frequencies higher than 60 Hz is under consideration.

*2.* — The voltage bands for d.c. installations are under consideration.

## 2. Definitions

### 2.1 Nominal voltage

Voltage by which an installation (or a part of an installation) is designated.

*Notes 1.* — The actual value of the voltage in the installation may differ from the nominal voltage by a quantity within normal tolerances.

*2.* — Voltage transients, such as those due to switching, or temporary voltage variations due to abnormal operation, such as those due to fault conditions in the system supplying the installation, are not taken into consideration.

### 2.2 Earthed systems

Systems in which a point — generally the neutral point — is directly connected to earth without any intentional impedance.

### 2.3 Isolated or not effectively earthed systems

Systems in which no point is connected to earth or in which a point — generally the neutral point — is connected to earth by a limiting impedance.

## 3. Voltage bands

Voltage bands in which the installations shall be classified according to their nominal voltage are given in Table I:

- for earthed systems (Sub-clause 2.2), by the r.m.s. values of the voltages between phase and earth and between phases;
- for isolated or not effectively earthed systems (Sub-clause 2.3), by the r.m.s. value of the voltage between phases.

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Voltage bands

Bands	Earthed systems		Isolated or not effectively earthed systems *
	Phase to earth	Between phases	Between phases
I	$U \leq 50$	$U \leq 50$	$U \leq 50$
II	$50 < U \leq 600$	$50 < U \leq 1\ 000$	$50 < U \leq 1\ 000$

$U$  = nominal voltage of the installation.

\* If the neutral is distributed, electrical equipment supplied between phase and neutral is to be chosen so that its insulation corresponds to the voltage between phases.

*Note.* — This classification of voltage bands does not exclude the possibility of introducing intermediate values for some particular rules.

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE  
NORME DE LA CEI

INTERNATIONAL ELECTROTECHNICAL COMMISSION  
IEC STANDARD

Modification N° 1

Mai 1979  
à la

Amendment No. 1

May 1979  
to

Publication 449  
1973

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Les modifications contenues dans le présent document ont été approuvées suivant la Règle des Six Mois.

Les projets de modifications, discutés par le Comité d'Etudes N° 64, furent diffusés, comme documents 64(Bureau Central)70 et 64(Bureau Central)70A, pour approbation suivant la Règle des Six Mois en novembre 1977.

The amendments contained in this document have been approved under the Six Months' Rule.

The draft amendments, discussed by Technical Committee No. 64, were circulated, as Documents 64(Central Office)70 and 64(Central Office)70A, for approval under the Six Months' Rule in November 1977.



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## Page 5

## 1. Scope

Replace the existing first paragraph by the following:

This standard applies to a.c. electrical installations of buildings supplied at a frequency not exceeding 60 Hz and at a nominal voltage up to and including 1 000 V and to d.c. electrical installations of buildings supplied at a nominal voltage up to and including 1 500 V.

Publication 449 Amend. 1 (May 1979)

Delete Note 2.

## Page 7

## 3. Voltage bands

Amend the title of this clause and the heading of Table I to read:

A.C. voltage bands

Add the following new Clause 4:

## 4. D.C. voltage bands

D.C. voltage bands in which the installations shall be classified according to their nominal voltage are given in Table II:

- for earthed systems (Sub-clause 2.2), by the values of the voltages between pole and earth and between poles;
- for isolated or not effectively earthed systems (Sub-clause 2.3), by the value of the voltage between poles.

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TABLE II

*D.C. voltage bands*

Bands	Earthed systems		Isolated or not effectively earthed systems *
	Pole to earth	Between poles	Between poles
I	$U \leq 120$	$U \leq 120$	$U \leq 120$
II	$120 < U \leq 900$	$120 < U \leq 1\,500$	$120 < U \leq 1\,500$

$U$  = nominal voltage of the installation (volts).  
\* If a middle wire is distributed, electrical equipment supplied between poles and middle wire is to be chosen so that its insulation corresponds to the voltage between poles.

Notes 1. — The values of this table relate to ripple-free d.c.

2. — This classification of voltage bands does not exclude the possibility of introducing intermediate limits for some particular rules.

Publication 449 Amend. 1 (May 1979)