

Electrical installations of buildings - Part 4: Protection for safety - Chapter 44: Protection against overvoltages - Section 442: Protection of low-voltage installations against faults between high-voltage systems and earth

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-HD 384.4.442 S1:2003 sisaldab Euroopa standardi HD 384.4.442 S1:1997 ingliskeelset teksti.

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English version

Electrical installations of buildings
Part 4: Protection for safety
Chapter 44: Protection against overvoltages
Section 442: Protection of low-voltage installations against
faults between high-voltage systems and earth

Installations électriques des bâtiments
Partie 4: Protection pour assurer la
sécurité
Chapitre 44: Protection contre les
surtensions
Section 442: Protection des installations
à basse tension contre les défauts à la
terre dans les installations à haute
tension

Elektrische Anlagen von Gebäuden
Teil 4: Schutzmaßnahmen
Kapitel 44: Schutz bei Überspannungen
Hauptabschnitt 442: Schutz von
Niederspannungsanlagen bei
Erdschlüssen in Netzen mit höherer
Spannung

This Harmonization Document was approved by CENELEC on 1996-12-09. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document on a national level.

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This Harmonization Document exists in three official versions (English, French, German).

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

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INTRODUCTION

The fault-current flowing in the earthing arrangement of the transformer sub-station causes a significant rise of the potential with respect to earth whose magnitude is governed by:

- the fault-current magnitude, and
- the impedance of the earthing arrangement of the transformer sub-station.

The fault-current may cause:

- a general rise of the potential of the low-voltage system with respect to earth, i.e. power-frequency stress voltages which may cause a breakdown of the insulation in low-voltage equipment.
- a general rise of the potential of the exposed-conductive-parts of the low-voltage system with respect to earth.

NOTE - In this section, the expression "high-voltage" refers to voltages exceeding the upper limit of voltage band II (See IEC 449). The expression "low-voltage" refers to voltages not exceeding the upper limit of voltage band II (See IEC 449).

442.1 General

442.1.1 Scope and object

The rules of this section provide requirements for the safety of persons and equipment in the low-voltage installation in the event of a fault between the high-voltage system and earth in the transformer sub-station which supplies the low-voltage installation.

The requirements for the connection of the exposed-conductive-parts of the transformer sub-station to the earthing arrangement of the transformer sub-station are given in prEN50179. (CENELEC TC 99X).

The rules of this section do not apply to low-voltage systems which are part of the public electricity supply network.

442.1.2 Power-Frequency Stress-Voltage

The magnitude and the duration of the power-frequency stress-voltage of the low-voltage equipment in the low-voltage installation due to an earth fault in the high-voltage system shall not exceed the values of table 44A.

TABLE 44A

Permissible power-frequency stress-voltage on equipment in low-voltage installations (V rms)	Disconnecting time (s)
$U_0 + 250$	≤ 5
$U_0 + 1200$	≤ 5

In IT systems U_0 shall be replaced by the line-to-line voltage.

Note: 1 The power-frequency stress-voltage is the voltage which appears across the insulation of low-voltage equipment and across surge protective devices connected to the low-voltage system.

Note: 2 The requirements in respect of the power-frequency stress-voltage for the low-voltage equipment of the transformer sub-station are given in clause 442.4