NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB/T 16935.1-2023

Insulation coordination for equipment within low-voltage supply systems - Part 1: Principles, requirements and tests

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Foreword

This document was drafted in accordance with the rules provided in GB/T 1.1-2020 Directives for standardization - Part 1.Rules for the structure and drafting of standardizing documents.

This document is Part 1 of GB/T 16935, Insulation coordination for equipment within low-voltage supply systems. The following parts have been issued for GB/T 16935.

-- Part 1.Principles, requirements and tests;

-- Part 2-1.Application guide - Explanation of the application of the GB/T 16935 series, dimensioning example and dielectric testing;

-- Part 2 -2.Interface considerations - Application guide;

-- Part 3.Use of coating, potting or moulding for protection against pollution;

-- Part 4.Consideration of high-frequency voltage stress;

-- Part 5.Comprehensive method for determining clearances and creepage distances equal to or less than 2 mm.

This document replaces GB/T 16935.1-2008, Insulation coordination for equipment within low-voltage systems - Part 1.Principles requirements and tests. Compared with GB/T 16935.1-2008, except for structural adjustment and editorial changes, the main technical changes are as follows.

-- CHANGE the scope (see Clause 1; Clause 1 of the 2008 edition);

-- ADD terms such as "low-voltage supply system", "mains supply" and "steady-state working voltage" (see 3.1.1, 3.1.2, 3.1.8, etc.), CHANGE terms such as "working overvoltage", "flashover" and "electrical breakdown" (see 3.1.7, 3.1.46, 3.1.44, etc.; 3.7.2, 3.20.2, 3.20, etc. of the 2008 edition), and DELETE terms such as "switching overvoltage", "lightning overvoltage" and "functional overvoltage" (see 3.7.3, 3.7.4, 3.7.5, etc. of the 2008 edition);

-- ADD 1500 V DC to tables in Annex B and Annex F;

-- CHANGE the correction factor at an altitude of 1 000 m from 0.844 to 0.884 (see Table F.10; Table F.8 of the 2008 edition).

This document is identical to IEC 60664-1.2020, Insulation coordination for equipment

within low-voltage supply systems - Part 1.Principles, requirements and tests.

The following minimal editorial changes are made to this document.

Insulation coordination for equipment within low-voltage

supply systems - Part 1.Principles, requirements and tests

1 Scope

This document deals with insulation coordination for equipment having a rated voltage up to AC 1 000 V or DC 1 500 V connected to low-voltage supply systems.

This document applies to frequencies up to 30 kHz.

This document applies to equipment for use up to 2 000 m above sea level and provides guidance for use at higher altitudes (See 5.2.3.4).

This document provides requirements for technical committees to determine clearances, creepage distances and criteria for solid insulation. It includes methods of electrical testing with respect to insulation coordination.

The minimum clearances specified in this document do not apply where ionized gases are present. Special requirements for such situations can be specified at the discretion of the relevant technical committee.

However, in case of missing specified values for clearances, creepage distances and requirements for solid insulation in the relevant product standards, or even missing standards, this document applies.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 2423.22-2012, Environmental testing - Part 2.Tests methods - Test N. Change of temperature (IEC 60068-2-14.2009, IDT)

IEC 60068-2-2, Environmental testing - Part 2-2.Tests - Test B. Dry heat

Note. GB/T 2423.2-2008, Environmental testing - Part 2.Test methods - Tests B.

Dry heat (IEC 60068-2-2.2007, IDT)

IEC 60068-2-78, Environmental testing - Part 2-78.Tests - Test Cab. Damp heat, steady state

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1

low-voltage supply system

All installations and plant provided for the purpose of generating, transmitting and distributing electricity.

[Source. GB/T 2900.50-2008, 601-01-01, modified]

3.1.2

mains supply

AC or DC power distribution system (external to the equipment) that supplies operating power to the equipment.

4.1 General requirements

Insulation coordination requires the selection of the electric insulation technical characteristics of the equipment with regard to its application and in relation to its surroundings and environmental conditions.

Insulation coordination represents one aspect of the safety of persons, livestock and property, so that the probability of risk of incidents due to voltage stresses does not lead to an unacceptable risk of harm.

This document addresses insulation coordination for any kind of hazard. Technical committees shall take into account the concepts of clearance, creepage distance and solid insulation as well as the concepts of functional insulation, basic insulation, supplementary insulation, double insulation and reinforced insulation for the specific hazard considering the nature of the hazard.

5.1.1 Means of insulation coordination