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DESIGN ALBUM OF NATIONAL BUILDING STANDARD

14D504

(Replacing 03D501-4)

Grounding device installation

接地装置安装

China Institute of Building Standard Design & Research

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General

Instructions for compilation

1 Compilation basis

1.1 It was compiled according to the JZH [2012] No.131 "Notice on Issuing 2012 National Building Standard Design and Compilation Work Plan"

1.2 Major standards and codes that were basis for this Album:

GB 16895.3-2004, Low-voltage electrical installations -- Part 5-54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors

GB/T 16895.9-2000, Electrical installations of buildings. Part 7: Requirements for special installations or locations. Section 707-Earthing requirements for the installation of data processing equipment

GB 16895.20-2003, Low-voltage electrical installations -- Part 5-55: Selection and erection of electrical equipment -- Other equipment

GB/T 16895.1-2008, Low-voltage electrical installations -- Part 1: Fundamental principles, assessment of general characteristics, definitions

GB/T 16895.10-2010, Low-voltage electrical installations -- Part 4-44: Protection for safety -- Protection against voltage disturbances and electromagnetic disturbances

GB 14050-2008, Types and safety technical requirements of system earthing

GB/T 50065-2011, Types and safety technical requirements of system earthing

GB 50057-2010, Types and safety technical requirements of system earthing

GB 12158-2006, General guideline for preventing electrostatic accidents

GB 50074-2014, Code for design of oil depot

GB 50169-2006, Code for design of oil depot

GB 50303-2015, Code for acceptance of construction quality of building electrical engineering

IEC 60364-5-54:2011, Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors

When the standards and codes are revised or new standards and codes are published and implemented, the contents of this Album that are inconsistent with the current engineering construction standards shall be deemed invalid. When engineering and technical personnel refer to this Album, they shall distinguish the applicable conditions and review and select the relevant contents of this Album.

2 Applicable Scope

This Album is applicable to the construction and installation of protective grounding, functional grounding, lightning protective grounding and anti-static grounding configurations in general industrial and civil buildings.

3 Main Contents

This Album is a revised version of the National Building Standard Design 03D501-4 "Grounding device installation". The Album adds a variety of functional grounding types for low-voltage power generation equipment, one-point grounding between the neutral point of the low-voltage distribution device power supply and PE in multi-power supply systems, system grounding for low-voltage distribution single busbar segmented wiring, and system grounding for high-voltage diesel power generation equipment., the mutual influence of the voltages between the protective grounding of distribution transformers and the functional grounding of low-voltage systems, the application of its components of grounding conductors specified in IEC 60364-5-54:2011, the composition of the grounding network composed of different systems and device grounding systems in engineering projects, electrostatic protection engineering applications, functional information equipment grounding configuration, etc. It replaces 03D501-4.

4 Compilation method

4.1 The Album is compiled according to the categories of "Grounding system", "Grounding grid, grounding pole", "Grounding conductor (wire)", "Anti-static grounding", and "Related technical materials".

4.2 The "Grounding system" of the Album includes preparation instructions, schematic block diagrams of grounding configurations for protection purposes, examples of grounding configurations and protective conductors, schematic diagrams of engineering project grounding configuration structures, examples of grounding measures in existing buildings, etc., to facilitate understanding of the practices and components of different grounding configuration systems.

4.3 According to the relevant regulations of GB 16895.3, GB/T 50065-2011 and GB/T 16895.10, the grounding pole, grounding grid, main grounding terminal, grounding trunk, protective grounding, functional grounding, anti-static grounding, design and installation construction are compiled in the Album.

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4.4 The Album introduces the copper-aluminum composite strap recommended by the Ministry of Industry and Information Technology as the material for the main grounding terminal and grounding trunk.

4.5 This Album recommends the nano-coating anti-corrosion grounding devices commonly used in chemical and petrochemical projects.

4.6 This Album recommends the installation method of vertical grounding poles for deeply buried low-resistance modules using drilling methods for places with high soil resistivity.

4.7 This Album incorporates an intelligent grounding resistance monitoring system for the safety requirements of lightning protection and anti-static for equipment in explosive hazardous environments.

5 General requirements for grounding configurations

5.1 Depending on the requirements of the electrical installation, the grounding configuration can serve both or separately as protective grounding and functional grounding. The requirements for protective grounding shall be met first.

5.2 If there is a grounding pole inside the low-voltage installation, the grounding pole shall be connected to the main grounding terminal with a grounding conductor.

5.3 When the device is powered by high voltage, the grounding configuration requirements involving high-voltage power supply and low-voltage electrical devices shall comply with the provisions of Articles 7.2.5 and 7.2.6 of GB/T 50065-2011.

5.4 The ground connection in the grounding configuration requirements shall meet the following requirements:

5.4.1 The protection requirements for the device shall be reliable and applicable.

5.4.2 It can conduct ground fault current and protective earth conductor current into the ground without causing harmful heat, thermal-mechanical, electromechanical stress and electric shock hazard due to the current.

5.4.3 If the grounding configuration also has functional grounding, it shall also meet the corresponding requirements of functionality.

5.4.4 It withstands foreseeable external influences such as mechanical stress and corrosion.

5.5 The grounding configuration shall take into account the effects of high frequency currents expected to flow.

5.6 Protection against electric shock shall not be adversely affected by any foreseeable changes in grounded electrical contacts, such as corrosion, drying or freezing.

5.7 When electrical devices such as distribution transformers are installed in the power distribution device room of the building that supplies power, their grounding configuration shall be connected to the building's foundation steel bars, etc.

5.8 The grounding of the lightning arrester protecting the distribution transformer shall share a grounding configuration with the transformer protective grounding.

5.9 Outdoor box-type substations, independent building substations and power stations, and open-air storage tanks shall be equipped with a ring grounding configuration around them.

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