

Translated English of Chinese Standard: GB14050-2008

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

ICS 91.140.50

K 09

GB 14050-2008

Replacing GB 14050-1993

Types and safety technical requirements of system earthing

系统接地的型式及安全技术要求

Issued on: September 24, 2008

Implemented on: August 01, 2009

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine;**

**Standardization Administration of the People's Republic of
China.**

Table of Contents

Foreword	3
1 Scope	5
2 Normative references	5
3 Terms and definitions.....	5
4 Types of system earthing.....	8
4.1 TN system	8
4.2 TT system	10
5 Safety technical requirements for system earthing	11
5.1 Basic requirements.....	11
5.2 TN system	13
5.3 TT system	15
5.4 IT system.....	15

Types and safety technical requirements of system earthing

1 Scope

This Standard specifies types and safety technical requirements of system earthing. Its purpose is to protect human and equipment safety.

This Standard is applicable to the power grid of which the system nominal voltage is AC 220/380V.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 477-2008, *Method for size analysis of coal*

GB 13955, *Installation and operation of residual current operated protective devices*

GB 16895.3-2004, *Electrical installations of buildings - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements, protective conductors and protective bonding conductors* (IEC 60364-5-54:2002, IDT)

3 Terms and definitions

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

3.1 electrical installation

A combination of related electrical equipment for one or several specific purposes.

3.2 exposed conductive part

The conductive part that is easy to touch and the part that is not conductive but

The conductor that is used for the electrical connection BETWEEN the given point of device, installation or system AND earthing electrode, and that has low impedance.

[GB/T 4776-2008, definition 3.3.3.9]

3.8 touch voltage

Unexpected voltage between two points that are touched by the human body at the same time.

[GB/T 4776-2008, definition 3.2.4]

NOTE 1: By convention, this term is used only in relation to indirect contact protection.

NOTE 2: In some cases, the contact voltage value may be significantly affected by the impedance of the person who touches these parts.

3.9 prospect live touch voltage

The possible maximum contact voltage when the impedance in the electrical installation is negligible.

3.10 system earthing

The earthing at a point on a side of system power supply (usually the neutral point).

3.11 protective earthing

One or more earthing-s that are placed on equipment, installation or system for safety purpose

[GB/T 4776-2008, definition 3.3.2.3]

3.12 main equipotential bonding; MEB

Electrical connection that makes electric potential of the exposed conductive part of each conductor and the extraneous conductive part of electrical installation basically equal.

3.13 supplementary equipotential bonding; SEB

The conductive part that uses conductor to directly connect two objects to make electric potential roughly equal.

monitoring device.

- b) The exposed conductive part in electrical installation shall be connected to earthing electrode by protecting the conductor or the neutral conductor, so as to ensure the formation of failure circuits.

Any exposed conductive part that can be touched by human body at the same time shall be connected to the same earthing system.

5.1.2 The main equipotential bonding in system shall be implemented as much as possible.

The main equipotential bonding in buildings shall be interconnected to the following conductive parts:

- a) main protective conductor (protective line trunk);
- b) main earthing conductor (earthing line trunk) or main earthing terminal;
- c) common metal pipes and similar metal components in buildings (such as water pipes, gas pipes, etc.);
- d) metal parts in the building structure, central heating and air conditioning system.

The electrically conductive body from the outside of the building shall be connected to the equipotential bonding conductor as close as possible at the entrance in the building.

The main equipotential bonding conductor must comply with the provisions of 544.1 in GB 16895.3-2004.

5.1.3 In the following cases, it shall consider implementing the supplementary equipotential bonding:

- in the local area, when the time of automatic power cutoff cannot meet the requirements for electric shock prevention;
- at a specific place, when it requires to have electric shock protection measures with lower contact voltage requirements;
- when it has requirements for lightning protection and information system anti-interference.

The supplementary equipotential bonding shall be interconnected with the following conductive parts in the area:

- a) all exposed conductive parts of the fixed device that can be touched simultaneously;

Z_s - Impedance of failure loop, in ohms (Ω);

I_a - Current that ensures that the protective appliance automatically cuts off the power supply within the specified time, in amperes (A);

U_0 - Ground nominal voltage, in volts (V).

In equation (1), the power cutoff time related to I_a refers to:

- a) For the end circuit that supplies power directly to the Class I handheld device (or the device that needs to be moved by hand) for the end circuit powered by socket or without the socket, it is no more than 0.4s;
- b) For the end circuit for power distribution circuit or only for fixed equipment, it is no more than 5s.

5.2.3 TN system mainly provides electric shock protection by overcurrent protection appliance. If the overcurrent protection appliance cannot meet the requirements of 5.2.2, it shall use main equipotential bonding or take partial equipotential bonding measures. It may also add residual current action protection device or take equipotential bonding measures together with adding residual current action protection device or other indirect contact protections to meet the requirements.

In TN-C system, it cannot install residual current action protection device. If it must be installed, the system earthing type shall be converted from TN-C to TN-C-S or form a local TT system.

5.2.4 In TN-C and TN-C-S systems, PEN conductor shall meet the following requirements:

- a) It must be insulated according to the possible highest voltage;

NOTE: The PEN conductor inside the complete switchgear and control equipment may not be required.

- b) The conductive part outside the electrical installation must not be used to replace PEN conductor;
- c) After the PEN conductor in TN-C-S system is separated into neutral conductor and protective conductor from some point, it is not allowed to merge or touch each other. At the point of separation, the protective conductor and the neutral conductor must have a terminal or busbar respectively. The PEN conductor must be connected to the terminal or busbar that is used for the protective conductor.

5.2.5 The PEN conductor (or protective conductor) in the system shall be grounded repeatedly at the entrance of the building. If there is a convenient

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----