SS 551:2022
BS 7430:2011+A1:2015, MOD

(ICS 13.260; 29.240.01)

SINGAPORE STANDARD

Code of practice for earthing

[BS title: Code of practice for protective earthing of electrical installations]

Singapore Standards Council

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Contents Page

Figures

National Foreword

This Singapore Standard was prepared by the Working Group on Earthing set up by the Technical Committee on Building Facilities and Services under the purview of Electrical and Electronic Standards Committee (EESC).

This standard is a revision of SS 551:2009 “Code of practice for earthing”. It is a modified adoption of BS 7430:2011+A1:2015, “Code of practice for protective earthing of electrical installations” and is implemented with the permission of the British Standards Limited.

In this standard, certain modifications due to editorial changes and layout, and technical deviations have been added directly to the clauses to which they refer. Due to the insertion of additional subclauses and figures in between the contents of the document, the numbering of some of the subclauses and figures was adjusted accordingly. A complete list of modifications, together with their justifications, is given in Annex ZA.

The modifications made to BS 7430:2011+A1:2015 were mainly to retain the provisions of the BS 7430:1998 as they are still applicable in Singapore. Those changes in BS 7430:2011+A1:2015 to align with UK legislation are not applicable in the local context and thus were not adopted.

This revision also includes the clarification of earthing methods at the substation of the local utility electricity and gas distribution company, in which the method or requirement may have to be changed. Hence, this utility distributor’s requirements would take precedence.

The main changes made in this revision are the addition of the following clauses:

a) Clause 7.2 on industrial and commercial distribution systems;
b) Clause 13 on earthing of conductors for safe working;
c) Clause 14 on substations;
d) Clause 15.5 on documentation.

Acknowledgement is made for the use of information from the above publication.

NOTE

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions. Where SSs are deemed to be stable, i.e. no foreseeable changes in them, they will be classified as “mature standards”. Mature standards will not be subject to further review, unless there are requests to review such standards.*

2. *An SS or TR is voluntary in nature except when it is made mandatory by a regulatory authority. It can also be cited in contracts making its application a business necessity. Users are advised to assess and determine whether the SS or TR is suitable for their intended use or purpose. If required, they should refer to the relevant professionals or experts for advice on the use of the document. Enterprise Singapore and the Singapore Standards Council shall not be liable for any damages whether directly or indirectly suffered by anyone or any organisation as a result of the use of any SS or TR. Although care has been taken to draft this standard, users are also advised to ensure that they apply the information after due diligence.*

3. *Compliance with a SS or TR does not exempt users from any legal obligations.*

Code of practice for earthing

1 Scope

This standard provides guidance on meeting the requirements for the earthing of electrical installations, including:

a) protective earthing of low voltage installations to SS 638;

b) the interface between LV and HV substations within buildings; and

c) protective earthing and changeover switch arrangements for generators supplying low voltage installations.

The earthing of a system or installation is generally provided for reasons of safety.

This standard applies only to land-based installations in and around buildings. It does not apply to:

1) ships, aircraft or offshore installations;

2) earthing of medical equipment;

3) special problems encountered with solid state electronic components;

4) equipment sensitive to static electricity;

5) requirements for functional earthing;

6) earthing of overhead lines between electrical installations; or

7) the internal earthing of equipment.

2 Normative references

The following referenced documents are indispensable for the application of this Code. For dated references, only the edition cited applies. For undated references, the latest edition of the document (including any amendments) applies.

BS 143 and 1256	Threaded pipe fittings in malleable cast iron and cast copper alloy
BS 1377-3	Methods of test for soils for civil engineering purposes. Chemical and electro-chemical testing
BS 4363	Specification for distribution assemblies for reduced low voltage electricity supplies for construction and building sites
BS 6423	Code of practice for maintenance of low voltage switchgear and controlgear
BS 6626	Maintenance of electrical switchgear and controlgear for voltages above 1 kV and up to and including 36 kV. Code of practice
BS 6701	Telecommunications equipment and telecommunications cabling – Specification for installation, operation and maintenance
BS 6867	Maintenance of electrical switchgear for voltages above 36 kV. Code of practice

BS 7454	Method for calculation of thermally permissible short-circuit currents, taking into account non-adiabatic heating affects
BS EN 10025-1	Hot rolled products of structural steels – General technical delivery conditions
BS EN 10025-2	Hot rolled products of structural steels – Technical delivery conditions for non-alloy structural steels
BS EN 1011-4	Welding. Recommendations for welding of metallic materials – Arc welding of aluminium and aluminium alloys
BS EN 50164-2	Lightning protection components (LPC) – Requirements for conductors and earth electrodes
BS EN 50522	Earthing of power installations exceeding 1 kV a.c.
IEC 60079-0	Explosive atmospheres – Part 0: Equipment – General requirements
IEC 60309-1	Plugs, fixed or portable socket-outlets and appliance inlets for industrial purposes – Part 1: General requirements
IEC 60364-1	Low-voltage electrical installations – Part 1: Fundamental principles, assessment of general characteristics, definitions
IEC 61140	Protection against electric shock – Common aspects for installation and equipment
IEC 61557-1	Electrical safety in low voltage distribution systems up to 1 000 V AC and 1 500 V DC – Equipment for testing, measuring or monitoring of protective measures – Part 1: General requirements
IEC 61936-1	Power installations exceeding 1 kV AC and 1,5 kV DC – Part 1: AC
IEC 62040-1	Uninterruptible power systems (UPS) – Part 1: Safety requirements
IEC 88528-11	Reciprocating internal combustion engine driven alternating current generating sets – Part 11: Rotary uninterruptible power systems – Performance requirements and test methods
ISO 1461	Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods
SS 322	Specification for earthing and bonding clamps
SS 538	Code of practice for maintenance of electrical equipment of electrical installations
SS 638	Code of practice for electrical installations
SS 555	Protection against lightning
SS 650-1	Code of practice for temporary electrical installations – Part 1: Construction and building sites
SS 650-2	Code of practice for temporary electrical installations – Part 2: Festive lighting, trade-fairs, mini-fairs and exhibition sites
TIA-607	Generic telecommunications bonding and grounding (earthing) for customer premises