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(ICS 13.260; 91.140.50)

SINGAPORE STANDARD

Code of practice for earthing

(Formerly CP 16)

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The Technical Committee on Earthing, appointed by the Electrical and Electronic Standards Committee and responsible for the preparation of this standard consists of representatives from the following organisations:

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Foreword

This Singapore Standard was prepared by the Technical Committee on Earthing under the purview of the Electrical and Electronic Standards Committee. This standard is the result of the revision of Singapore Standard CP 16 : 1991 and has been renumbered as SS 551.

This Code was revised to give an updated guidance on the principles and practices of earthing. The main changes are:

- Earthing for substations, generator sets and consumers' electrical installations which include both industrial and commercial installations;
- Integration of earthing and lightning protection system;
- Dedicated section on street lighting and electrically-supplied street furniture, which incorporates a myriad of electrically operated equipment and products;
- Emphasis on earthing of conductors for safe working;
- Elaboration on periodic inspection and testing to maintain the integrity and reliability of earthing systems.

The earthing and bonding requirements of electrical installations in buildings are covered in depth in Singapore Standard Code of Practice for Electrical Installations, SS CP 5 : 1998.

This Code is an adoption of BS 7430 : 1998 (except for Clause 2 which is aligned to SS CP 5 : 1998) and relevant clauses of Draft BS 7430 : 2007 and is implemented with the permission of the British Standards Publishing Ltd.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

Code of practice for earthing

1 Scope and normative references

1.1 Scope

1.1.1 General

This Code gives guidance on the methods which may be adopted to earth an electrical system for the purpose of limiting the potential (with respect to the general mass of the earth) of current-carrying conductors forming part of the system, and non-current-carrying metalwork associated with equipment, apparatus, and appliances connected to the system.

The former object is normally essential to the proper operation of the system, and this aspect is generally known as "system earthing". The latter concerns the safety of human life, of animals and of property, and this aspect is sometimes known as "equipment earthing".

The term "earthing" is used in this regard whether or not reliance is placed on the earth itself as a low impedance return path for earth fault current.

1.1.2 Exclusion from scope

This Code applies to land-based installations; it does not apply to trains, ships, aircraft or offshore installations, nor does it deal with the earthing of medical equipment or special problems encountered with solid-state electronic components and equipment due to their sensitivity to static electricity.

This standard does not address electromagnetic compatibility requirements for earthing, nor does it give recommendation for functional earthing.

1.1.3 Materials, appliances and components

Materials, appliances and components should comply with the relevant Singapore Standards, International Electrotechnical Commission Publications, British Standards or other equivalent national standards.

1.2 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	Methods of test for soils for civil engineering purposes
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 electrical switchgear and controlgear for voltages up to and including 1 kV
BS 6626	Code of practice for maintenance of electrical switchgear and controlgear for voltages above 1 kV and up to and including 36 kV

BS 6701	Telecommunications equipment and telecommunications cabling. Specification for installation, operation and maintenance
BS 6867	Code of practice for maintenance of electrical switchgear for voltages above 36 kV
BS EN 10025-1	Hot rolled products of structural steels. General technical delivery conditions
BS EN 1011-4	Welding. Recommendations for welding of metallic materials. Arc welding of aluminium and aluminium alloys
BS EN 13636	Cathodic protection of buried metallic tanks and related piping
BS EN 15112	External cathodic protection of well casing
IEC 60079-0	Explosive atmospheres - Part 0: Equipment - General requirements
IEC 60309-1	Plugs, socket-outlets and couplers 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 1000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 1: General requirements
IEC 61558-1	Safety of power transformers, power supplies, reactors and similar products – Part 1: General requirements and tests
SS 97-1	Residual current operated circuit-breaker without integral overcurrent protection for household and similar uses (RCCBs) – General rules
SS 322	Earthing and bonding clamps
SS 538	Code of practice for maintenance of electrical equipment of electrical installations
SS CP 5	Code of practice for electrical installations
SS CP 33	Code of practice for lightning protection
SS CP 88	Code of practice for temporary electrical installations – Construction and building sites
TIA-J-STD-607-A	Commercial building grounding (earthing) and bonding requirements for telecommunications