

IEEE Standard for Metal-Clad Switchgear

IEEE Power and Energy Society

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Switchgear Committee

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of the
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Abstract: Metal-clad (MC) medium-voltage switchgear that contains drawout electrically operated circuit breakers is covered. MC switchgear is compartmentalized to isolate components such as instrumentation, main bus, and both incoming and outgoing connections with grounded metal barriers. Rated maximum voltage levels for metal-clad switchgear range from 4.76 kV to 38 kV with main bus continuous current ratings of 1200 A, 2000 A, 3000 A, and 4000 A. MC switchgear also contains associated control, instruments, metering, relaying, protective, and regulating devices, as necessary. Service conditions, ratings, temperature limitations and classification of insulating materials, insulation (dielectric) withstand voltage requirements, test procedures, and applications are discussed.

Keywords: control, cumulative loading, current transformers, drawout, IEEE C37.20.2™, indoor, instrumentation, load current-carrying, metal-clad (MC) switchgear, metal-enclosed (ME) power switchgear, outdoor, protection, switchgear assemblies, transformer accuracy, voltage transformers

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Introduction

This introduction is not part of IEEE Std C37.20.2™-2015, IEEE Standard for Metal-Clad Switchgear.

This standard has been revised to reflect needed technical changes that have been suggested since the last revision to IEEE C37.20.2™ was published in 1999. The significant changes include:

- Addition of 4000 A as a preferred continuous current rating
- Addition of new definitions for types of insulation as used in metal-clad (MC) switchgear
- Addition of special considerations/requirements when generator circuit breakers are used in MC switchgear
- Clarification/expansion of the tests for insulation materials
- Updating of the seismic qualification test references
- Update to finish and construction requirements
- Addition of Annex C for Partial Discharge testing and Annex D for Voltage Dividers
- Conversion of “Notes” to normative text (where appropriate)

This standard includes only the requirements for metal-clad switchgear. These requirements were previously a part of IEEE Std C37.20™-1969, IEEE Standard for Switchgear Assemblies Including Metal-Enclosed Bus (1974 consolidated edition).¹ Other types of equipment previously included in IEEE Std C37.20-1969 are incorporated in separate publications.

For many years, IEEE Std C37.20-1969 covered all switchgear assemblies, including metal-enclosed bus. Standards committees of the IEEE Switchgear Assemblies Subcommittee and the NEMA Power Switchgear Assemblies Technical Committee recommended that the document be further developed and, where appropriate, that the various sections be identified with their own standards. This approach also coordinates with the Conformance Test Procedure Standards.

The IEEE Switchgear Assemblies Subcommittee was responsible for this revision.

This publication is one of a series covering Switchgear Assemblies. Members of the series are as follows:

- IEEE Std C37.20.1™, IEEE Standard for Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear.^{2,3}
- IEEE Std C37.20.2™, IEEE Standard for Metal-Clad Switchgear.
- IEEE Std C37.20.3™, IEEE Standard for Metal-Enclosed Interrupter Switchgear.
- IEEE Std C37.20.6™, IEEE Standard for 4.76 kV to 38 kV Rated Ground and Test Devices Used in Enclosures.

¹ Information on references can be found in Clause 2.

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- IEEE Std C37.20.7TM, Guide for Testing Metal-Enclosed Switchgear for Internal Arcing Faults.
- IEEE PC37.20.9TM, IEEE Standard for Gas-Insulated Switchgear rated up to 52kV.⁴
- IEEE Std C37.21TM, IEEE Standard for Control Switchboards.
- IEEE Std C37.23TM, IEEE Standard for Metal-Enclosed Bus.
- IEEE C37.24TM, IEEE Guide for Evaluating the Effect of Solar Radiation on Outdoor Metal-Enclosed Switchgear.

Figure A depicts types of switchgear assemblies and related standards documents:

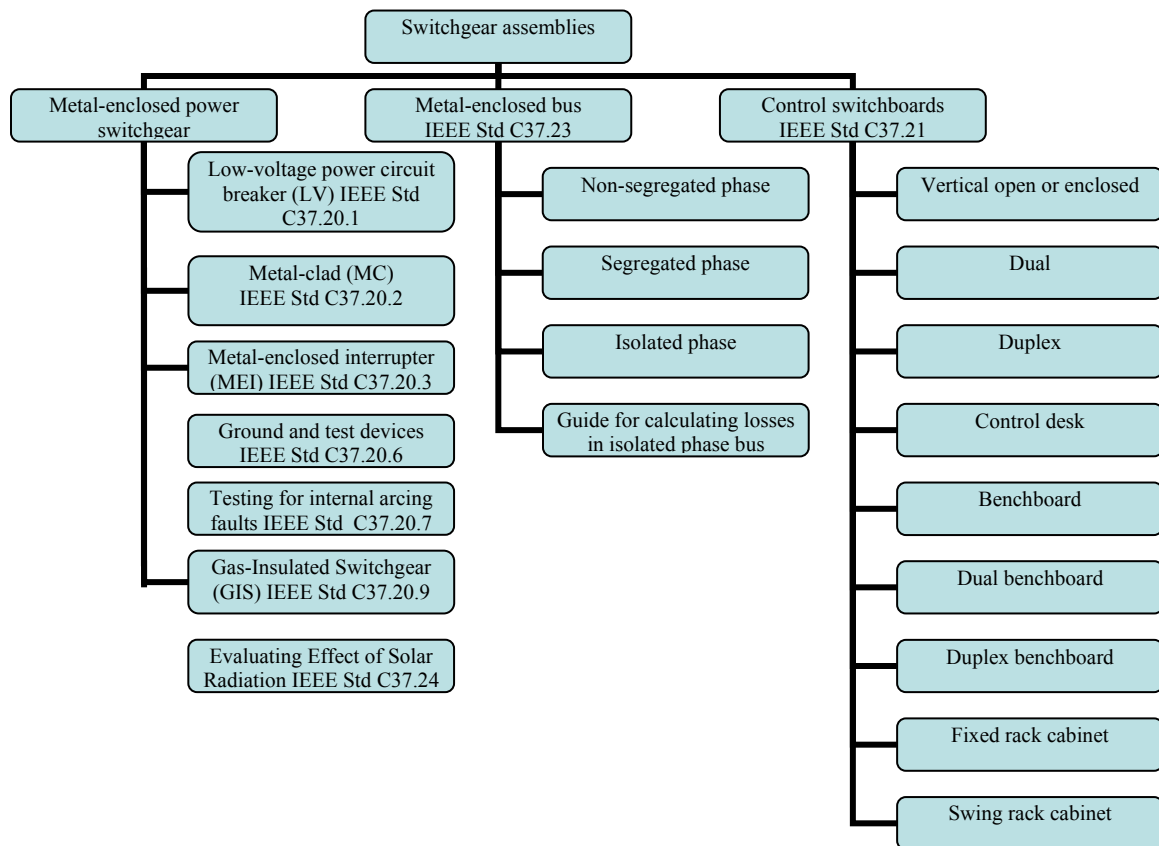


Figure A—Types of switchgear assemblies

⁴ Numbers preceded by P are IEEE authorized standards projects that were not approved by the IEEE-SA Standards Board at the time this publication went to press. For information about obtaining drafts, contact the IEEE. Note that PC37.20.9 is in process.

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1. Overview

1.1 Scope

This standard covers metal-clad switchgear containing, but not limited to, such devices as power circuit breakers, other interrupting devices, switches, control, instrumentation and metering, and protective and regulating equipment. It includes, but is not specifically limited to, equipment for the control and protection of apparatus used for power generation, conversion, and transmission and distribution.

This standard is concerned with enclosed, rather than open, indoor and outdoor switchgear assemblies rated above 1000 V ac. Included is equipment that is part of primary and secondary unit substations. Gas insulated substation equipment is not included.

In this standard, metal-clad switchgear will be called MC switchgear.

1.2 Purpose

This standard provides information essential to designing and testing of metal-clad switchgear. Included herein are preferred ratings, required design test procedures, and acceptance criteria. A detailed description of construction requirements; including required functional performance features, structural materials, insulation, and interlocking is provided. Additionally, information on equipment application with respect to operating conditions, dielectric capabilities, and detailed application information regarding continuous current capabilities under differing ambient temperature conditions and application involving short-term overloading is included.