

# IEEE Standard for Metal-Enclosed Low-Voltage (1000 Vac and below, 3200 Vdc and below) Power Circuit Breaker Switchgear

IEEE Power and Energy Society

Sponsored by the  
Switchgear Committee



# **IEEE Standard for Metal-Enclosed Low-Voltage (1000 Vac and below, 3200 Vdc and below) Power Circuit Breaker Switchgear**

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**Switchgear Committee**  
of the  
**IEEE Power and Energy Society**

Approved 26 March 2015

**IEEE-SA Standards Board**

**Abstract:** Metal-enclosed, low-voltage switchgear—which contains either stationary or drawout, manually or electrically operated low-voltage ac or dc power circuit breakers in individual metal compartments, in three-pole, four-pole, two-pole, or single-pole construction—is covered. Rated maximum voltage levels are 254 V, 508 V, 635 V, 730 V, or 1058 Vac; and 300/325 V, 600 V, 800 V, 1000 V, 1200 V, 1500 V, 1600 V, or 3200 Vdc. The preferred continuous current ratings of the main bus in ac designs are 1600 A, 2000 A, 3000 A, 3200 A, 4000 A, 5000 A, 6000 A, 8000 A, or 10 000 A. For dc designs, the preferred ratings are 1600 A, 2000 A, 2500 A, 3000 A, 4000 A, 5000 A, 6000 A, 8000 A, 10 000 A, or 12 000 A. The switchgear may also contain associated control, instruments, metering, protective, and regulating devices as necessary. The standard deals with service conditions, ratings, temperature limitations, and classification of insulating materials, insulation (dielectric) withstand voltage requirements, test procedures, and application.

**Keywords:** circuit breaker, control, cumulative loading, current transformers, drawout, IEEE C37.20.1™, indoor, instrumentation, load current-carrying, metal-enclosed, metering, outdoor, protection, stationary, switchgear

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## Introduction

This introduction is not part of IEEE Std C37.20.1™-2015, IEEE Standard for Metal-Enclosed Low-Voltage (1000 Vac and below, 3200 Vdc and below) Power Circuit Breaker Switchgear.

This standard has been revised to reflect needed technical changes that have been suggested since the last revision to IEEE Std C37.20.1™ that was published in 2002. Major editorial and technical changes have been incorporated. The more significant changes include the following:

- a) Expansion of maximum voltage ratings to include 730 Vac and 1058 Vac, plus 600 Vdc and 1500 Vdc, to coordinate with changes being made to the NEC, IEEE Std C37.13™, and IEEE Std C37.14™.
- b) The historic altitude correction factors in previous editions have been retained.

This standard includes only the requirements for metal-enclosed low-voltage power circuit breaker switchgear. These requirements were previously a part of IEEE Std C37.20™-1969 (Reaff 1981), IEEE Standard for Switchgear Assemblies Including Metal-Enclosed Bus (1974 consolidated edition). Other types of equipment previously included in IEEE Std C37.20-1969 are incorporated in separate publications.

The IEEE Switchgear Assemblies subcommittee of the IEEE Power and Energy Switchgear Committee was responsible for this revision.

The working group expresses its deep appreciation to Christina Long for her work in creating and editing this document.

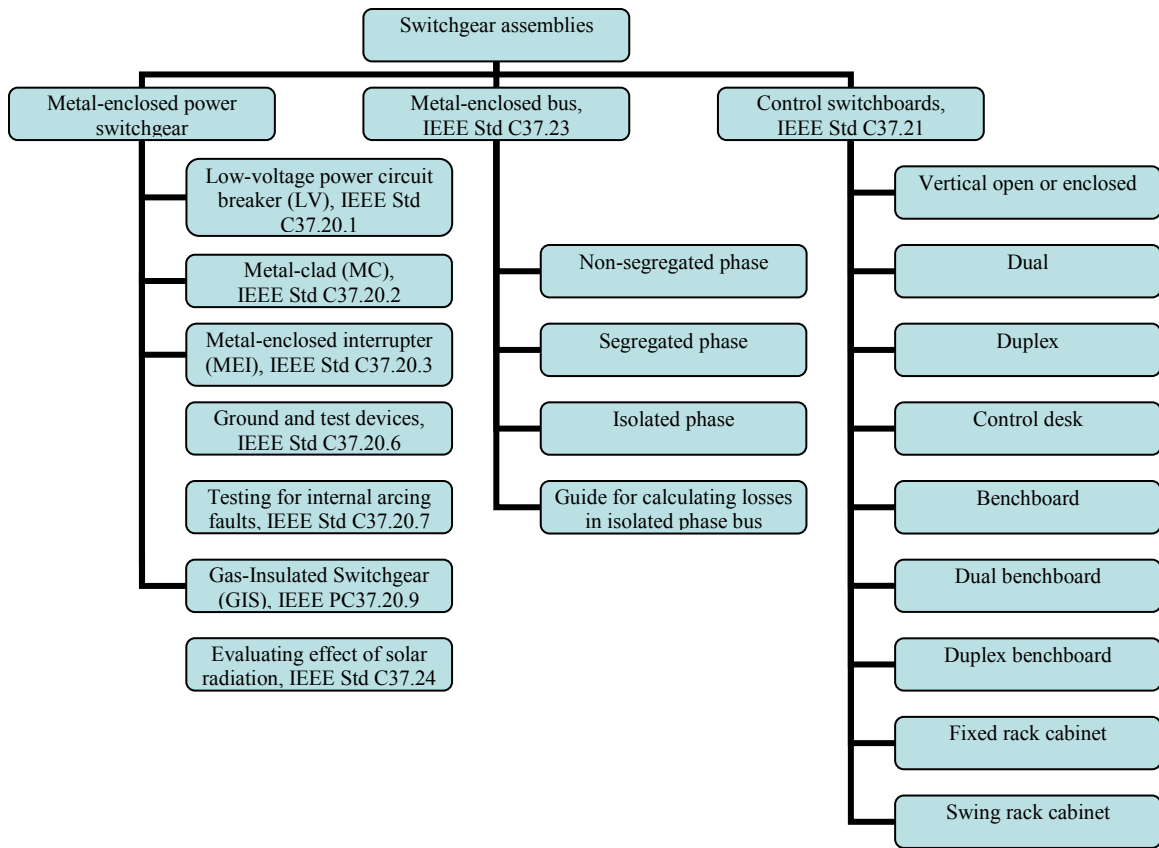
This publication is one of a series covering switchgear assemblies as follows:

- a) IEEE Std C37.20.1™, IEEE Standard for Metal-Enclosed Low-Voltage (1000 Vac and below, 3200 Vdc and below) Power Circuit Breaker Switchgear.
- b) IEEE Std C37.20.2™, IEEE Standard for Metal-Clad Switchgear.
- c) IEEE Std C37.20.3™, IEEE Standard for Metal-Enclosed Interrupter Switchgear (1 kV-38 kV).
- d) IEEE Std C37.20.7™, IEEE Guide for Testing Switchgear Rated 38 kV or below for Internal Arcing Faults
- e) IEEE Std C37.21™, IEEE Standard for Control Switchboards.
- f) IEEE Std C37.23™, IEEE Standard for Metal-Enclosed Bus.
- g) PC37.20.9, IEEE Standard for Metal-Enclosed Switchgear Rated 1 kV–52 kV Incorporating Gas Insulation Systems<sup>a</sup>

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<sup>a</sup> 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.

Figure A depicts types of switchgear assemblies and standards pertinent to switchgear assemblies.



**Figure A—Types of switchgear assemblies**

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## 1. Scope

This standard covers metal-enclosed low-voltage power circuit breaker switchgear assemblies containing, but not limited to, such devices as low-voltage power circuit breakers (fused or unfused); other interrupting devices; switches, control, instrumentation, and metering; and protective and regulating equipment.

This standard is concerned with enclosed, rather than open, indoor and outdoor switchgear assemblies. It includes types of equipment that are part of secondary unit substations. It does not apply to equipment covered by industrial control standards, communication switchboards, communication switching equipment, switchboards for use on board ships, or dead-front distribution switchboards.

In this standard, metal-enclosed low-voltage power circuit breaker switchgear shall be called LV switchgear. For LV ac switchgear, the nominal system voltage shall be 1000 Vac or below; for LV dc switchgear, the rated maximum voltage shall be 3200 Vdc or below.