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(Revision of IEEE Std C37.20.1-1993)

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IEEE Standard for Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear

IEEE Power Engineering Society

Sponsored by the
Switchgear Committee

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IEEE Power Engineering Society

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Abstract: Low-voltage metal-enclosed switchgear—which contains either stationary or drawout, manually or electrically operated low-voltage ac or dc power circuit breakers in individual grounded metal compartments, in three-pole, two-pole, or single-pole construction—is covered. Rated maximum voltage levels are 254V, 508V, or 635V (ac) and 300/325V, 800V, 1000V, 1200V, 1600V, or 3200V (dc). The preferred continuous current ratings of the main bus in ac designs are 1600A, 2000A, 3000A, 3200A, 4000A, or 5000A. For dc designs, the preferred ratings are 1600A, 2000A, 2500A, 3000A, 4000A, 5000A, 6000A, 8000A, 10000A, or 12000A. 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, indoor, instrumentation, load current-carrying, metering, outdoor, protection, stationary

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Introduction

(This Introduction is not a part of IEEE Std C37.20.1-2002, IEEE Standard for Metal-Enclosed Low-Voltage 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 1993. Major editorial and technical changes have been incorporated. The more significant changes include the following:

a) Major expansion of text describing the design testing requirements in order to more fully delineate objective test criteria and performance evaluation guidelines. In most cases, it is felt that the text elaboration captures test requirements that were previously understood by test laboratories and designers, but not adequately delineated in the document.
b) Addition of new definitions for mechanism-operated contact (MOC) and truck-operated contact (TOC) switches, previously contained in IEEE Std C37.2-1996, but necessary for full understanding of metal-enclosed low-voltage power circuit breaker switchgear.
c) Expansion of discussion of the requirements for LV dc switchgear, including devices commonly used in such switchgear, and coordination with on-going changes to related standards, including IEEE Std C37.14™-1999.[a]
d) Changes to coordinate with other documents in the IEEE Std C37.20.x series of documents, particularly with IEEE Std C37.20.2™-1999 for metal-clad switchgear. This coordination is maintained on an ongoing basis so as to treat common subjects in an equivalent manner.
e) Addition of explanatory text related to short-circuit current ratings in 5.4.4.
f) Updating and expansion of requirements for control wiring in 7.1.3.
g) Conversion to the International System of Units (SI), the modernized metric system.

It is also noted that the altitude correction factors listed in Table 11 of this standard are under review by an IEEE Switchgear Committee Working Group, PC37.100.1, on Common Requirements for Power Switchgear. The old values are included in this document for reference until the Working Group releases the new values, at which time the new values will supersede those in the current Table 11.

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 Committee was responsible for this revision.

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

1) IEEE Std C37.20.1-2002, IEEE Standard for Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear.
2) IEEE Std C37.20.2-1999, IEEE Standard for Metal-Clad Switchgear.
3) IEEE Std C37.20.3™-2001, IEEE Standard for Metal-Enclosed Interrupter Switchgear.
4) IEEE Std C37.20.7™-2001, IEEE Guide for Testing Medium-Voltage Metal-Enclosed Switchgear for Internal Arcing Faults.

[a]Information on references can be found in Clause 2.

5) IEEE Std C37.21™-1985, IEEE Standard for Control Switchboards.
6) IEEE Std C37.23™-1987, IEEE Standard for Metal-Enclosed Bus and Calculating Losses in Isolated Phase Bus.

Figure A depicts types of switchgear assemblies.

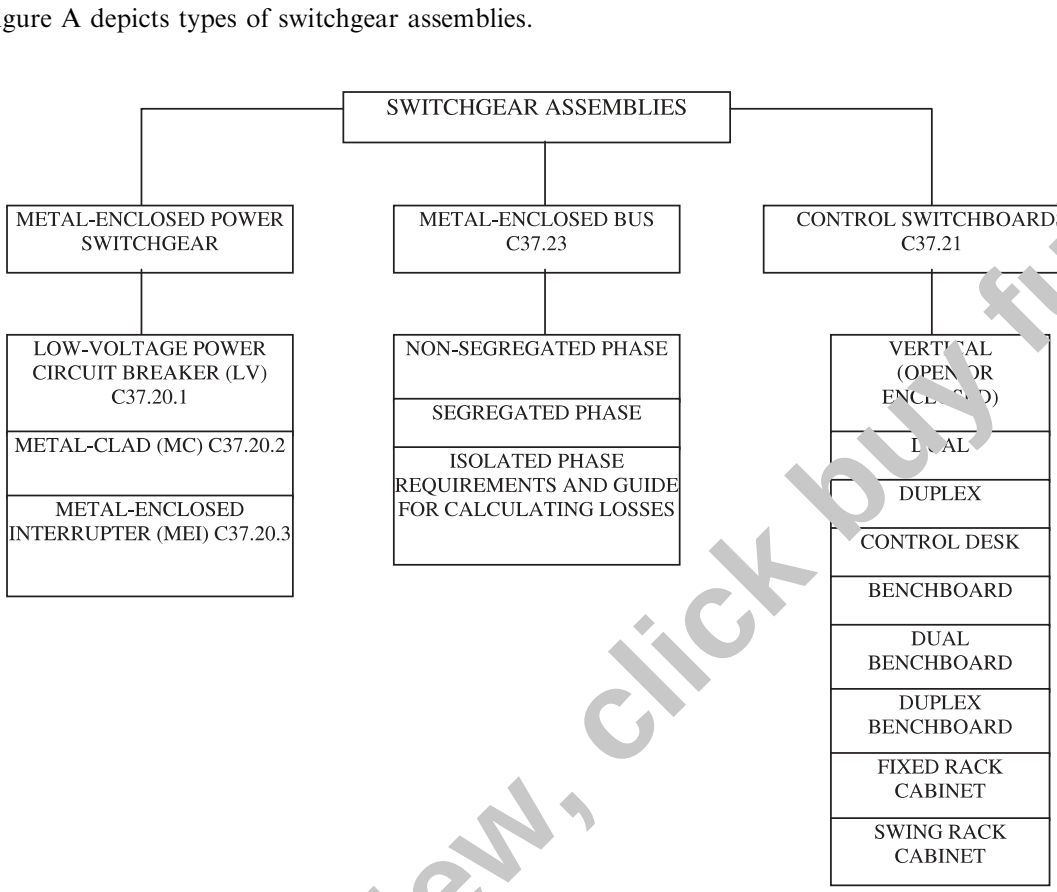

Figure A– Types of switchgear assemblies

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IEEE Standard for Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear

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 voltage shall be 1000 V or below; for LV dc switchgear, the voltage shall be 3200 V or below.

2. References

This standard shall be used in conjunction with the following publications. When the publications referenced in this standard are superseded by an approved revision, the revision shall apply.

ANSI C2-2002, National Electrical Safety Code® (NESC®), American National Standards Institute.[1,2]

ANSI C37.16-2000, Low-Voltage Power Circuit Breakers and AC Power Circuit Protectors: Preferred Ratings, Related Requirements, and Application Recommendations.

[1]ANSI publications are available from the Sales Department, American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, USA (http://www.ansi.org).

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