NEMA Standards Publication

ANSI C37.54-2002 (R2010, R2020)

American National Standard for Indoor Alternating Current High-Voltage Circuit Breakers Applied as Removable Elements in Metal-Enclosed Switchgear—Conformance Test Procedures

National Electrical Manufacturers Association

National Electrical Manufacturers Association
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Secretariat:

National Electrical Manufacturers Association

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Foreword (This foreword is not part of American National Standard C37.54-2002.)

Major revisions have been made in this edition to coordinate with the revisions to ANSI/IEEE C37.04, ANSI C37.06, ANSI/IEEE C37.09, and ANSI/IEEE C37.20.2 in 1999-2000. The historic voltage range factor (K) has been changed to a value of 1.0, effectively eliminating the voltage range factor from the Standards. This simplifies testing of products, and test procedures from ANSI/IEEE C37.09 have been incorporated where appropriate.

Since both the voltage range factor (K) and asymmetry factor (S) have been eliminated, the "Required asymmetrical interrupting capability (I_t)" described in clause 5.8.2.2 of ANSI/IEEE C37.04 has been used to define the service capability demonstration in Test Duty SC2. This formerly was a value of 400% rSI and the new value of 400% I_t is equivalent.

Explanatory text has been added to clause 4.3.1 relative to 'trip-free' requirements, as ANSI/IEEE C37.04 does not include the historic 'trip-free' adjective in discussing the mechanism requirements in clause 6.9(1) of that document. This language has been added to avoid future confusion for users of this document.

Since this edition eliminates the voltage range factor, circuit breakers with K ≠ 1.0 which may be produced after the approval date of this Standard should have conformance tests conducted in accordance with the procedures in the 1996 edition of C37.54.

This Standard has been revised by the Power Switchgear Assemblies Technical Committee of the Switchgear Section, the National Electrical Manufacturers Association (NEMA 8SGV).

This Standard was developed to describe selected tests and procedures to demonstrate conformance in accordance with clause 6.2 ANSI/IEEE C37.09. The scope of this Standard is limited to Conformance Test Procedures for Indoor Alternating Current High-Voltage Circuit Breakers Applied as Removable Elements in Metal Enclosed Switchgear Assemblies. To facilitate its use and to permit timely revisions based on experience, a separate document has been provided.

This Standard is one of several in a series of test procedure Standards for conformance testing of switchgear products. While this Standard is written for general guidance, performance criteria are established so that this Standard can be adopted as the basis for certification of identified circuit breakers for use in installations subject to regulation by public authorities and similar agencies concerned with law ordinances, regulations, administrative orders and similar instruments. It is noted that certain utility installations continue to be excluded from the scope of this Standard as a result of historic discussions among representatives from IEEE and NEMA.

Suggestions for improvements are welcome, and should be sent to the National Electrical Manufacturers Association, 1300 North 17th Street, Rosslyn, VA 22209.

This Standard was processed and approved for submittal to ANSI by Accredited Standards Committee on Power Switchgear C37. Committee approval of the Standard does not necessarily imply that all committee Members voted for its approval. At the time of its approval, the C37 Committee had the following Members:

T. Olsen, Chair
J. Collins, Secretary

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The following Members of the NEMA Power Switchgear Assemblies Technical Committee worked on this Standard prior to its publication:

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S. Slattery
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1 General

1.1 Scope

1.1.1 Scope and objectives

When conformance tests are required, this Standard specifies tests to demonstrate that the circuit breaker being tested conforms with the ratings assigned to it in accordance with ANSI/IEEE C37.04. Preferred ratings are listed in ANSI C37.06. As a requirement of conformance testing, the circuit breaker shall have completed the design testing requirements of ANSI/IEEE C37.09. If ANSI/IEEE C37.09 tests have not been previously performed, the tests required by ANSI/IEEE C37.09 beyond tests described by this Standard may be performed concurrently with conformance testing.

Note: Additional tests per ANSI/IEEE C37.09 need not be witnessed by the certifying party.

1.1.2 Application

This Standard applies to Indoor Alternating Current High-Voltage Circuit Breakers rated above 1000 volts used as removable elements in Metal-Enclosed Switchgear Assemblies in accordance with clause 3.1.5 “Metal-Clad Switchgear” of ANSI/IEEE C37.20.2.

1.1.3 Installations not covered

This Standard does not apply to installations under the exclusive control of electric utilities for the purpose of communication, or metering, or for the generation, control, transformation, transmission, and distribution of electric energy located in buildings used exclusively by utilities for such purposes or located outdoors on property owned or leased by the utility or on public highways, streets, roads, etc., or outdoors by established rights on private property.

1.1.4 Voltage range factor (K)

This Standard applies to circuit breakers rated in accordance with ANSI C37.06-2000, with voltage range factor (K) equal to 1.0. For circuit breakers rated to ANSI C37.06-1987 (or earlier), regardless of the value of the K factor, the procedures for conformance tests are contained in the 1996 edition of this Standard (C37.54-1996).

1.2 Definitions

The definitions of terms contained in this Standard, or in other Standards referred to in this Standard, are not intended to embrace all legitimate meanings of the terms. They are applicable only to the subject treated in this Standard.

If a term is not defined in this Standard, the definition in ANSI/IEEE C37.100 applies. An asterisk (*) following a definition indicates that the definition in this Standard is not contained in ANSI/IEEE C37.100, while a dagger (†) indicates that the definition differs from that in ANSI/IEEE C37.100.