IEEE STANDARDS ASSOCIATION

IEEE Standard Requirements for Electrical Control for AC High-Voltage (>1000 V) Circuit Breakers

IEEE Power and Energy Society

Sponsored by the

Switchgear Committee

REDLINE

Shows changes from the previous version!

IEEE
3 Park Avenue
New York, NY 10016-5997
USA

IEEE Std C37.11™-2014
(Revision of
IEEE Std C37.11-1997)

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 12:55:56 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C37.11-2014

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 12:55:56 UTC from IEEE Xplore. Restrictions apply.
Full document details: IEEE C37.11-2014

This is a Redline Document produced by Techstreet, a business of Thomson Reuters.

This document is intended to provide users with an indication of changes from one edition to the next. It includes a full-text version of the new document, plus an indication of changes from the previous version.

Redlines are designed to save time and improve efficiencies by using the latest software technology to find and highlight document changes. More professionals are using valuable new technologies like redlines, to help improve outcomes in a fastpaced global business world.

Because it may not be technically possible to capture all changes accurately, it is recommended that users consult previous editions as appropriate. In all cases, only the current base version of this publication is to be considered the official document.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 12:55:56 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C37.11-2014

Redline Processing Notes:

1. ~~**Red Text**~~ - Red strikethrough text denotes deletions.

2. **Blue Text** - Blue underlined text denotes modifications and additions.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 12:55:56 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C37.11-2014

IEEE Std C37.11™-2014
(Revision of
IEEE Std C37.11-1997)

IEEE Standard Requirements for Electrical Control for AC High-Voltage (>1000 V) Circuit Breakers

Sponsor

Switchgear Committee
of the
IEEE Power and Energy Society

Approved 10 December 2014

IEEE-SA Standards Board

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 12:55:56 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C37.11-2014

Abstract: Standard requirements for all types of electrical control circuits for ac high-voltage circuit breakers rated above 1000 V are given. This standard is applicable for any type of power-operated mechanism and for both ac and dc control power. Only basic control elements of the circuit breaker, including reclosing where required, are included in this standard. Devices or circuits for protective relaying, special interlocking, etc., are not included.

Keywords: ac high-voltage circuit breakers, alarm circuits, auxiliary contacts, auxiliary switch, closing, control schemes, electrical control, grounding, heater circuits, IEEE C37.11™, metal-clad switchgear, metal-enclosed switchgear, motor circuits, opening, re-closing, tripping

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

Copyright © 2015 by The Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 19 February 2015. Printed in the United States of America.

IEEE is a registered trademark in the U.S. Patent & Trademark Office, owned by The Institute of Electrical and Electronics Engineers, Incorporated.

PDF: ISBN 978-0-7381-9504-9 STD20091
Print: ISBN 978-0-7381-9505-6 STDPD20091

IEEE prohibits discrimination, harassment, and bullying.
For more information, visit http://www.ieee.org/web/aboutus/whatis/policies/p9-26.html.
No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 12:55:56 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C37.11-2014

Important Notices and Disclaimers Concerning IEEE Standards Documents

IEEE documents are made available for use subject to important notices and legal disclaimers. These notices and disclaimers, or a reference to this page, appear in all standards and may be found under the heading "Important Notice" or "Important Notices and Disclaimers Concerning IEEE Standards Documents."

Notice and Disclaimer of Liability Concerning the Use of IEEE Standards Documents

IEEE Standards documents (standards, recommended practices, and guides), both full-use and trial-use, are developed within IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association ("IEEE-SA") Standards Board. IEEE ("the Institute") develops its standards through a consensus development process, approved by the American National Standards Institute ("ANSI"), which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and participate without compensation from IEEE. While IEEE administers the process and establishes rules to promote fairness in the consensus development process, IEEE does not independently evaluate, test, or verify the accuracy of any of the information or the soundness of any judgments contained in its standards.

IEEE does not warrant or represent the accuracy or content of the material contained in its standards, and expressly disclaims all warranties (express, implied and statutory) not included in this or any other document relating to the standard, including, but not limited to, the warranties of: merchantability; fitness for a particular purpose; non-infringement; and quality, accuracy, effectiveness, currency, or completeness of material. In addition, IEEE disclaims any and all conditions relating to: results; and workmanlike effort. IEEE standards documents are supplied "AS IS" and "WITH ALL FAULTS."

Use of an IEEE standard is wholly voluntary. The existence of an IEEE standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard.

In publishing and making its standards available, IEEE is not suggesting or rendering professional or other services for, or on behalf of, any person or entity nor is IEEE undertaking to perform any duty owed by any other person or entity to another. Any person utilizing any IEEE Standards document, should rely upon his or her own independent judgment in the exercise of reasonable care in any given circumstances or, as appropriate, seek the advice of a competent professional in determining the appropriateness of a given IEEE standard.

IN NO EVENT SHALL IEEE BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO: PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE PUBLICATION, USE OF, OR RELIANCE UPON ANY STANDARD, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE AND REGARDLESS OF WHETHER SUCH DAMAGE WAS FORESEEABLE.

Translations

The IEEE consensus development process involves the review of documents in English only. In the event that an IEEE standard is translated, only the English version published by IEEE should be considered the approved IEEE standard.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 12:55:56 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C37.11-2014

Official statements

A statement, written or oral, that is not processed in accordance with the IEEE-SA Standards Board Operations Manual shall not be considered or inferred to be the official position of IEEE or any of its committees and shall not be considered to be, or be relied upon as, a formal position of IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position of IEEE.

Comments on standards

Comments for revision of IEEE Standards documents are welcome from any interested party, regardless of membership affiliation with IEEE. However, IEEE does not provide consulting information or advice pertaining to IEEE Standards documents. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments. Since IEEE standards represent a consensus of concerned interests, it is important that any responses to comments and questions also receive the concurrence of a balance of interests. For this reason, IEEE and the members of its societies and Standards Coordinating Committees are not able to provide an instant response to comments or questions except in those cases where the matter has previously been addressed. For the same reason, IEEE does not respond to interpretation requests. Any person who would like to participate in revisions to an IEEE standard is welcome to join the relevant IEEE working group.

Comments on standards should be submitted to the following address:

Secretary, IEEE-SA Standards Board
445 Hoes Lane
Piscataway, NJ 08854 USA

Laws and regulations

Users of IEEE Standards documents should consult all applicable laws and regulations. Compliance with the provisions of any IEEE Standards document does not imply compliance to any applicable regulatory requirements. Implementers of the standard are responsible for observing or referring to the applicable regulatory requirements. IEEE does not, by the publication of its standards, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

IEEE draft and approved standards are copyrighted by IEEE under U.S. and international copyright laws. They are made available by IEEE and are adopted for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of engineering practices and methods. By making these documents available for use and adoption by public authorities and private users, IEEE does not waive any rights in copyright to the documents.

Photocopies

Subject to payment of the appropriate fee, IEEE will grant users a limited, non-exclusive license to photocopy portions of any individual standard for company or organizational internal use or individual, non-commercial use only. To arrange for payment of licensing fees, please contact Copyright Clearance Center, Customer Service, 222 Rosewood Drive, Danvers, MA 01923 USA; +1 978 750 8400. Permission to photocopy portions of any individual standard for educational classroom use can also be obtained through the Copyright Clearance Center.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 12:55:56 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C37.11-2014

Updating of IEEE Standards documents

Users of IEEE Standards documents should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of amendments, corrigenda, or errata. An official IEEE document at any point in time consists of the current edition of the document together with any amendments, corrigenda, or errata then in effect.

Every IEEE standard is subjected to review at least every ten years. When a document is more than ten years old and has not undergone a revision process, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE standard.

In order to determine whether a given document is the current edition and whether it has been amended through the issuance of amendments, corrigenda, or errata, visit the IEEE-SA Website at http://ieeexplore.ieee.org/xpl/standards.jsp or contact IEEE at the address listed previously. For more information about the IEEE-SA or IEEE's standards development process, visit the IEEE-SA Website at http://standards.ieee.org.

Errata

Errata, if any, for all IEEE standards can be accessed on the IEEE-SA Website at the following URL: http://standards.ieee.org/findstds/errata/index.html. Users are encouraged to check this URL for errata periodically.

Patents

Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken by the IEEE with respect to the existence or validity of any patent rights in connection therewith. If a patent holder or patent applicant has filed a statement of assurance via an Accepted Letter of Assurance, then the statement is listed on the IEEE-SA Website at http://standards.ieee.org/about/sasb/patcom/patents.html. Letters of Assurance may indicate whether the Submitter is willing or unwilling to grant licenses under patent rights without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination to applicants desiring to obtain such licenses.

Essential Patent Claims may exist for which a Letter of Assurance has not been received. The IEEE is not responsible for identifying Essential Patent Claims for which a license may be required, for conducting inquiries into the legal validity or scope of Patents Claims, or determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory. Users of this standard are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. Further information may be obtained from the IEEE Standards Association.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 12:55:56 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C37.11-2014

Participants

At the time this IEEE standard was completed, the HVCB Electrical Controls Working Group had the following membership:

John C. Webb, *Chair*
Mike Crawford, *Vice Chair*

Michael Anderson
Mauricio Aristizabal
Robert Barnett
W.J. (Bill) Bergman
Stan Billings
Arben Bufi
Eldridge Byron
Gilbert Carmona
Patrick Di Lillo
Douglas J. Edwards
Hua Ying Liu
Russell Long
Anthony Ricciuti
Michael Skidmore
Wes Wadsworth
Jiong Zhang
Xi Zhu

The following members of the individual balloting committee voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

William Ackerman
Roy Alexander
Mauricio Aristizabal
Ficheux Arnaud
Robert Barnett
David Bassett
George Becker
Seth Benson
W.J. (Bill) Bergman
Stan Billings
Wallace Binder
Anne Bosma
Steven Brown
Ted Burse
William Byrd
Eldridge Byron
Paul Cardinal
Stephen Cary
Steven Chen
Chih Chow
Ray Davis
Gary Donner
Randall Dotson
Denis Dufournet
Edgar Dullni
Douglas J. Edwards
Ronald Esco
Frank Gerleve
Douglas Giraud
Mietek Glinkowski
Edwin Goodwin
James Graham
Randall Groves
Ajit Gwal
Timothy Hayden
Gary Heuston
Philip Hopkinson
Todd Irwin
John Kay
Gael Kennedy
Yuri Khersonsky
James Kinney
Joseph L. Koepfinger
Boris Kogan
Jim Kulchisky
Saumen Kundu
George Kyle
Chung-Yiu Lam
John Leach
Hua Ying Liu
Li Liu
Albert Livshitz
Greg Luri
William McBride
T. David Mills
Daleep Mohla
Georges Montillet
Jerry Murphy
Jeffrey Nelson
Michael Newman
Joe Nims
T. W. Olsen
Lorraine Padden
Richard Paes
Mirko Palazzo
Christopher Petrola
Iulian Profir
Anthony Ricciuti
Michael Roberts
Charles Rogers
Thomas Rozek
Steven Sano
Roderick Sauls
Bartien Sayogo
Robert Seitz
Hamid Sharifnia
Devki Sharma
Sushil Shinde
John Shullaw
Michael Sigmon
James Smith
Jerry Smith
Gary Stoedter
Ryan Stone
Paul Sullivan
James Swank
David Tepen
Malcolm Thaden
Joe Uchiyama
Eric Udren
John Vergis
Ilia Voloh
William Walter
John C. Webb
Kenneth White
Kenneth White
Larry Yonce
Jian Yu
Xi Zhu

Copyright © 2015 IEEE. All rights reserved.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 12:55:56 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C37.11-2014

When the IEEE-SA Standards Board approved this standard on 10 December 2014, it had the following membership:

John Kulick, *Chair*
Jon Walter Rosdahl, *Vice Chair*
Richard H. Hulett, *Past Chair*
Konstantinos Karachalios, *Secretary*

Peter Balma
Farooq Bari
Ted Burse
Clint Chaplain
Stephen Dukes
Jean-Phillippe Faure
Gary Hoffman
Michael Janezic
Jeffrey Katz
Joseph L. Koepfinger*
David J. Law
Hung Ling
Oleg Logvinov
Ted Olsen
Glenn Parsons
Ron Peterson
Adrian Stephens
Peter Sutherland
Yatin Trivedi
Phil Winston
Don Wright
Yu Yuan

*Member Emeritus

Also included are the following nonvoting IEEE-SA Standards Board liaisons:

Richard DeBlasio, *DOE Representative*
Michael Janezic, *NIST Representative*

Michelle Turner
IEEE-SA Content Production and Management

Erin Spiewak
IEEE-SA Technical Program Operations

Copyright © 2015 IEEE. All rights reserved.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 12:55:56 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C37.11-2014

Introduction

This introduction is not part of IEEE Std C37.11™-2014, IEEE Standard Requirements for Electrical Control for AC High-Voltage (>1000 V) Circuit Breakers.

This standard is a revision of IEEE Std C37.11-1997. There have been editorial changes in all figures and Figure 5 has had the requirement for safety disconnecting devices on all power sources clarified; Figure 9 has been added to reflect optional contacts which are commonly in use on many circuit breakers. Among the normative changes is one which allows the use of molded case circuit breakers or switches as disconnecting devices for control power on circuit breakers where previously only a knife switch or fuse block was permitted. The purpose is to bring this standard up-to-date and in line with present-day requirements for ac high-voltage power circuit breakers and to bring it into agreement with IEEE Std C37.100™-1992, IEEE Standard Definitions for Power Switchgear.

As reflected in the title, this standard applies to ac high-voltage circuit breakers rated on a symmetrical current basis. A wide variety of control schemes are now in use by companies. Many of these users consider it essential that their particular scheme be continued so as to maintain unified operating practices within their company. It has been necessary, therefore, to set up certain preferred arrangements for wiring at the circuit breaker. These arrangements, in effect, constitute standards for production of the circuit breakers. They are, however, sufficiently versatile to permit the majority of users to connect the circuit breaker to their external circuits to achieve the required control scheme without changing the internal wiring of the circuit breaker. Diagrams of typical operating connections are included in this standard to demonstrate this versatility.

A number of circuit breakers now incorporate electronics in their control devices. This standard has been updated to address certain aspects of circuit breaker operations with electronic control devices. Additionally, new circuit breakers which utilize a magnetic operator as the prime mover for the circuit breaker are now being produced; these are also considered in this standard.

This standard includes only the basic control elements of the circuit breaker, including reclosing where required. It does not include devices or circuits for protective relaying, special interlocking, etc., since these are dependent upon the specific application of a particular circuit breaker. This standard is not intended to preclude the possibility of obtaining, as additional equipment, such devices or circuits, including auxiliary switches in excess of the specified minimum requirements, where necessary in a specific application.

It is not intended that the standard be considered inflexible as to future change. Future developments in application and manufacturing, as well as further study of existing requirements, should result in revision and expansion of the standard.

The explanatory notes that appear in small type are included to give the user of this standard the reason or background for certain requirements.

Copyright © 2015 IEEE. All rights reserved.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 12:55:56 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C37.11-2014