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IEEE Application Guide for AC High-Voltage Circuit Breakers > 1000 Vac Rated on a Symmetrical Current Basis

IEEE Power and Energy Society

Sponsored by the
Switchgear Committee

IEEE
3 Park Avenue
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USA

IEEE Std C37.010™-2016
(Revision of
IEEE Std C37.010-1999)

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Abstract: The application of indoor and outdoor high-voltage circuit breakers rated above 1000 Vac for use in commercial, industrial, and utility installations is covered in this guide. It deals with usage under varied service conditions, temperature conditions affecting continuous current compensation, reduced dielectrics, reclosing derating as applicable, calculation of system short-circuit current, compensation at different X/R ratios, detailed calculations with application curves, out-of-phase switching, and general application.

Keywords: ambient compensation/emergency operation, capacitor switching, high-voltage circuit breakers, IEEE C37.010™, indoor drawout, outdoor, pollution level creepage distance, power frequency, line closing, load current switching, rated maximum voltage, short-circuit consideration, transformer current switching, TRV

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Introduction

This introduction is not part of IEEE Std C37.010–2016, IEEE Guide for AC High-Voltage Circuit Breakers > 1000 Vac Rated on a Symmetrical Current Basis.

This guide is a revision of IEEE Std C37.010™-1999 (Reaff 2005) and contains substantive changes due to the efforts of three coordinated Working Groups on revision and coordination of IEEE Std C37.04™, IEEE Std C37.09™, and IEEE Std C37.010.

Although much of the approach of IEEE Std C37.010–1999 has been retained, many editorial changes, significant enhancements, and some fundamental changes have been made.

Some of the major issues include the following:

— Some background information and clarification for controlled switching (IEEE Std C37.012™).

— Some background information and clarification for inductive current switching (IEEE Std C37.015™).

Evaluate existing test data for differing dc time constants (*X/R*).

Contents

List of Figures

List of Tables

IEEE Application Guide for AC High-Voltage Circuit Breakers > 1000 Vac Rated on a Symmetrical Current Basis

1. Overview

1.1 Scope

This application guide applies to the ac indoor and outdoor high-voltage circuit breakers rated in accordance with the methods given in IEEE Std C37.04 and IEEE Std C37.04a, listed in IEEE Std C37.06™, and tested in accordance with IEEE Std C37.09 and IEEE Std C37.09a.[1] Circuit breakers rated and manufactured to meet other standards should be applied in accordance with application procedures adapted to their specific ratings or applications.

1.2 Purpose

The purpose of this document is to provide guidance for the application of high-voltage circuit breakers which are rated in accordance with IEEE Std C37.04 and IEEE Std C37.06 and which are tested in accordance with IEEE Std C37.09 and other related standards.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

ANSI C37.7, Interrupting rating factors for reclosing service for AC high-voltage circuit breakers rated on a total current basis.[2]

IEC 62271-100, High-voltage switchgear and controlgear—Part 100: High-voltage alternating-current circuit-breakers.[3]

[1]Information on references can be found in Clause 2.
[2]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/).
[3]IEC publications are available from the Sales Department of the International Electrotechnical Commission, Case Postale 131, 3, rue de Varembé, CH-1211, Genève 20, Switzerland/Suisse (http://www.iec.ch/). IEC publications are also available in the United States from the Sales Department, American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, USA (http://www.ansi.org/).