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# IEEE Guide for the Application of Capacitance Current Switching for AC High-Voltage Circuit Breakers Above 1000 V

IEEE Power and Energy Society

Sponsored by the
Switchgear Committee

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IEEE Std C37.012™-2014
(Revision of
IEEE Std C37.012-2005)

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**Abstract:** Guidance for the application of ac high-voltage circuit breakers is provided. The application guide addresses the general theory of capacitance current switching; and the notions of restrike, re-ignition, non-sustained disruptive discharge (NSDD). Voltage factors used for single-phase testing as substitute for three-phase testing are explained. Application of circuit breakers for different network conditions and different capacitive loads (capacitor banks, cables, transmission lines, and filter banks) is treated.

**Keywords:** application, capacitance current switching, high-voltage circuit breakers, IEEE C37.012™, inrush current, non-sustained disruptive discharge, NSDD, overvoltages, re-ignition, restrike



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## Introduction

This introduction is not part of IEEE Std C37.012™-2014, IEEE Guide for the Application of Capacitance Current Switching for AC High-Voltage Circuit Breakers Above 1000 V.

This application guide is a revision of IEEE Std C37.012™-2005. This revision reflects the changes made to the capacitive current switching requirements and test procedures stated in IEEE Std C37.04a™-2003 and IEEE Std C37.09a™-2005. Furthermore, the following significant changes were made:

— The document was restructured to treat each case (capacitor bank, cable, and transmission line) in one clause;

— The basis for the calculation of inrush current was changed;

— Figures have been updated.

The subject of inrush and outrush current was not revised. This matter is currently under review.

## Contents

# IEEE Guide for the Application of Capacitance Current Switching for AC High-Voltage Circuit Breakers Above 1000 V



## Overview

### 1.1 Scope

This document revises the application guide for capacitance current switching for high-voltage circuit breakers rated in accordance with IEEE Std C37.04™ [1] and listed in IEEE Std C37.06™. It supplements IEEE Std C37.010™. Circuit breakers rated and manufactured to meet other standards should be applied in accordance with application procedures adapted to their specific ratings.

### 1.2 Purpose

This guide is intended for general use in the application of circuit breakers for capacitance current switching. Familiarity with other US national standards applying to circuit breakers is assumed, and provisions of those standards are indicated in this guide only when necessary for clarity in describing application requirements.

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