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IEEE Recommended Practice for

Applying Low Voltage Circuit Breakers Used in Industrial and Commercial Power Systems

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IEEE Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems

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Abstract: Information is provided for selecting the proper circuit breaker for a particular application. This recommended practice helps the application engineer specify the type of circuit breaker, ratings, trip functions, accessories, acceptance tests, and maintenance requirements. It also discusses circuit breakers for special applications, e.g., instantaneous only and switches. In addition, it provides information for applying circuit breakers at different locations in the power system, and for protecting specific components. Guidelines are also given for coordinating combinations of line-side and load-side devices.
Keywords: circuit breakers, circuit breaker evaluation, insulated case, insulated-case circuit breakers, low-voltage circuit breaker, low-voltage power circuit breaker, low-voltage protection, low-voltage protection device, molded case, molded-case circuit breaker, overcurrent protection, power circuit breaker, rating, testing

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Introduction

This introduction is not part of IEEE Std 1015-2006, IEEE Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems.

This introduction provides an engineer a comprehensive reference source to aid in deciding what type of low-voltage circuit breaker to use for a particular application, and how to apply the circuit breaker. This recommended practice includes a comparison between the standards of low-voltage power circuit breakers and molded-case circuit breakers so that an engineer can make better, more informed choices. Pertinent tables have been extracted from other standards to provide the basis for the selection and application guidelines. In addition, specific application examples are provided.

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This recommended practice is dedicated in memory of Shaun Slattery. The Working Group especially acknowledges his contributions to the original development of this recommended practice and his valuable insight into the material contained within this revision.

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CONTENTS

Chapter 6

Chapter 7

IEEE Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems

Chapter 1
Overview

1.1 Scope

This recommended practice provides information for selecting the proper circuit breaker for a particular application. This recommended practice helps the application engineer specify the type of circuit breaker, ratings, trip functions, accessories, acceptance tests, and maintenance requirements. It also discusses circuit breakers for special applications, e.g., instantaneous only and switches. In addition, it provides information for applying circuit breakers at different locations in the power system and for protecting specific components. Guidelines are given for coordinating combinations of line-side and load-side devices. Acceptance testing and maintenance guidelines are provided so that reliable operation can be verified and maintained.

This recommended practice does not cover the selection and application of circuit breakers such as marine circuit breakers and definite purpose circuit breakers.

1.2 Two classifications of breakers

There are two main classifications of low-voltage circuit breakers: molded-case circuit breakers and low-voltage power circuit breakers. Within the molded-case circuit breaker classification, there is another type of circuit breaker called the insulated-case circuit breaker. The construction and characteristics of these three types will be discussed. Throughout the balance of this recommended practice, these devices will be referred to as follows:

- MCCB: molded-case circuit breaker
- ICCB: insulated-case circuit breaker
- LVPCB: low-voltage power circuit breaker

Each one of these circuit breakers has different design characteristics and, in many cases, different application requirements.