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IEEE Guide for the Application of Thyristor Surge Protective Device Components

IEEE Power and Energy Society

Sponsored by the
Surge Protective Devices Committee

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Abstract: Applications information on fixed-voltage and gated-thyristor surge protective components (SPCs) is provided. Key device parameters and their sensitivities are explained. Several worked telecommunication circuit design examples are given.
Keywords: IEEE C62.37.1™, SPC, telecommunication circuits, thyristor surge protective component

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Introduction

This introduction is not part of IEEE Std C62.37.1-2012, IEEE Guide for the Application of Thyristor Surge Protective Device Components.

This application guide has been produced as the companion to the IEEE Std C62.37™-1996.[a] The thyristor surge protective component (SPC) parameters measured in IEEE Std C62.37-1996 are explained in terms of their application relevance and any operating condition sensitivities are discussed. Several worked telecommunication circuit design examples are given, together with overviews of system problems, such as SPC coordination.

There are a very large number of thyristor SPC variants available. The two basic families of fixed-voltage and gated-thyristor SPCs are further subdivided into bidirectional and unidirectional types. This guide provides information on these different types and the applications that they are most suited to. Substantive annexes provide information on design approaches, thyristor SPC technologies, device symbols, and equipment standards.

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

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IEEE Guide for the Application of Thyristor Surge Protective Device Components

1. Overview

1.1 Scope

This application guide applies to thyristor surge protective components (SPCs) used in systems with voltages up to 1000 V rms or 1200 V dc. These components are designed to limit overvoltages and divert surge currents by limiting the voltage and switching to a low-impedance state. Although telecommunication circuits are the main application of thyristor SPCs, this guide will also provide useful information for other protection applications. This guide is intended to complement and be used in conjunction with IEEE Std C62.37™-1996.[1]

1.2 Purpose

This guide is intended to provide assistance in selecting the most appropriate type of thyristor SPC for use in a surge protective device (SPD), equipment, or system application. IEEE Std C62.37-1996 defines thyristor SPC parameters and their measurement. This guide explains the basic functions, component structures, surge environment, comparative thyristor technologies, and how parameters are interpreted and selected for example applications.

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