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(Revision of
IEEE Std C62.64-1997)

IEEE Standard Specifications for Surge Protectors Used in Low-Voltage Data, Communications, and Signaling Circuits

Sponsor

Surge Protective Devices Committee
of the
IEEE Power & Energy Society

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Abstract: Surge protectors for application on multiconductor and coaxial, balanced or unbalanced, data, communications, and signaling circuits with voltages less than or equal to 1000 V rms or 1200 V dc are covered. These surge protectors are multiple-component series or parallel combinations of one or more nonlinear elements and zero or more linear elements. The tables of typical performance values provide a means of comparison among various surge protectors. They also provide a common engineering language beneficial to the user and manufacturer of surge protectors used in low-voltage data, communications, and signaling circuits.
Keywords: low voltage, performance, surge protector

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Introduction

This introduction is not part of IEEE Std C62.64-2009, IEEE Standard Specifications for Surge Protectors Used in Low-Voltage Data, Communications, and Signaling Circuits.

This revision of IEEE Std C62.64-1997 has been developed by the Low-Voltage Data, Communications, and Signaling Circuit Surge Protective Devices Working Group of the Low-Voltage Surge Protective Devices Subcommittee. It provides typical values of the parameters that are used to specify the performance of these surge protectors. The tests that are used to characterize the parameters are in IEEE Std C62.36™-2000, so the two standards are companion documents.[a]

This standard is directed toward service providers who wish to provide electrical protection against surges on low-voltage circuits. The typical values promote consistency by helping users in selecting appropriate parameter values and by aiding suppliers in focusing their resources on parameters of interest. Yet, this standard is flexible enough that applications needing values that differ from the typical levels can use whatever is required.

This standard covers a wide range of possible protectors. They may limit voltages, currents, or both. Not all specification values apply to each protector. The user of the standard selects, from among the many possible specifications, the tests and parameter values needed by the application. For instance, a protector for an application that requires only voltage limiting would not specify values from the current-limiting specifications, and would select only the parameters from the voltage-limiting specifications that are required by the application. In that way, a voltage-limiting surge protector may include, for example, a specification value for return loss (see 5.2.3.3), but not for longitudinal balance (see 5.2.3.4). The typical values of this standard also provide standardized values of important parameters for use with international standardization efforts.

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IEEE Standard Specifications for Surge Protectors Used in Low-Voltage Data, Communications, and Signaling Circuits

1. Overview

This standard is divided into five clauses, normative annexes (some of which are under study), a glossary, and a bibliography. Clause 1 provides the scope of this standard. Clause 2 lists references to publications that are needed to apply this standard. Clause 3 provides general definitions that may be needed for a surge protector regardless of its voltage- or current-limiting function. Clause 4 provides service and test conditions. Clause 5 provides requirements and test specifications.

1.1 Scope

This standard applies to surge protectors for application on multi-conductor and coaxial, balanced or unbalanced, data, communications, and signaling circuits with voltages less than or equal to 1000 V rms, or 1200 V dc. These surge protectors are intended to limit voltage surges, current surges, or both.

This standard is not intended to cover individual device components. Installation of all surge protectors (SPDs) must be in conformance with the requirements of applicable local and national electrical codes. Specifically excluded from this standard are protectors for low-voltage power circuit applications.

The surge protectors covered by this standard are to be tested by means of the connections or terminations that are used when the surge protector is installed in the field. For surge protectors that are intended to be used with a base or connector, that base or connector shall be part of the tests.

The tables of typical performance values of this standard provide a means of comparison among various surge protectors. They also provide a common engineering language beneficial to the user and manufacturer of surge protectors used in low-voltage data, communications, and signaling circuits.

1.2 SPD configurations

The surge protectors covered are multiple-component series or parallel combinations of linear or nonlinear elements, packaged for the purpose of limiting voltage, current, or both. Figure 1 is based on Figure 1 of IEEE Std C62.36™-2000 and illustrates functional block diagrams for the surge protectors covered by this standard.[1]

1.3 Use of this standard

1.3.1 Application types

Tables of applications in this standard often refer to application types. In such tables, each application type is given an alphanumeric designation that refers to a typical value(s) for that specific application. All of the typical values on the same row as the designator apply to that application type.

A given surge protector has the same designation in all application type tables. For example, a surge protector has application type designation A for the insulation resistance specification, and also application type designation A for the other specifications such as impulse-limiting voltage and impulse reset.

Table 1[2] describes the application types included in this document. For each application type (e.g., A), a short description is provided on the main characteristics of the surge protector (e.g., where used). Furthermore, each application type has further subcategories that address different designs of surge protectors applied to the same application type. These subcategories are:

a) *Main characteristics of the telecommunications circuit.* This subcategory is described in the second column of Table 1 and is designated by the first numeric number after the designation (see Table 1).

b) *Type of surge protector.* This subcategory is described in the third column of Table 1 and is designated by the second numeric number after the designation (see Table 1). This characteristic addresses the different surge protectors that may contain voltage-limiting devices, or current-limiting devices, or both.

For example, an application type can address primary surge protectors intended for paired conductors in telecommunications circuits (i.e., Public Switching Telephone Network, PSTN); the application type designation is A in Table 1. This application type may be subdivided to surge protectors that are intended for different services such as voice and certain Digital Subscriber Lines (DSLs) technologies; the application types are subdivided to A1, A2, and A3 as described in Table 1. In addition, the surge protectors may have different combinations of voltage and various types of current limiters such as non-resetting and self-resetting intended for the same subcategory (e.g., A1). For this reason, the application types are further subdivided to A11, A12, A14, and A13 as described in Table 1.

[1] Information on references can be found in Clause 2.
[2] The numbers in brackets correspond to those of the bibliography in Annex I.