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IEEE Standard Requirements for Power-Line Carrier Line Traps (30 kHz to 500 kHz)

IEEE Power and Energy Society

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USA

IEEE Std C93.3™-2017

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Abstract: Line traps inserted into a power line to provide a high impedance at power-line-carrier frequencies (30 kHz to 500 kHz) are covered in this standard. The purpose is to isolate the carrier signal from system impedance changes due to faults or switching behind the point of insertion, and to guide the signal in the proper direction. The standard covers line traps in which the main coil is designed as a single-phase, air-cooled inductor of the dry type.

Keywords: IEEE C93.3™, line trap, PLC, power line carrier, wave trap

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Introduction

This introduction is not part of IEEE Std C93.3™-2017, IEEE Standard Requirements for Power-Line Carrier Line Traps (30 kHz to 500 kHz).

This document was developed by the Power Line Carrier Subcommittee of the Power System Communications and Cybersecurity Committee, responsible for Power Line Carrier Equipment and Coupling Capacitor Voltage Transformers. During its development the standard received the benefits of a consensus of input from a balanced group representing the user, producer, government, and general-interest viewpoints. These inputs were harmonized and integrated into the standard in its present approved form.

The Power Line Carrier Subcommittee was established to coordinate, review, and update the existing documents into an effective group of standards, including this standard for line traps. A separate standard will be developed to cover each type of equipment described in the Subcommittee's scope.

This standard includes technical definitions, performance ratings, testing methods, and manufacturing requirements for line traps.

Essentially the changes reflected in this revision are new definitions, addition of information on emergency overload current capability of line traps with regards to Facility Rating standards, and the IEEE mandated change from US to metric units of measure.

This Standard was previously maintained by NEMA and was last released as ANSI C93.3-1995. It has been given over to IEEE to revise and maintain.

Contents

IEEE Standard Requirements for Power-Line Carrier Line Traps (30 kHz to 500 kHz)

1. Overview

1.1 Scope

This standard applies to a line trap inserted into a power line to provide a high impedance at power line carrier frequencies (30 kHz to 500 kHz). The purpose is to isolate the carrier signal from system impedance changes due to faults or switching behind the point of insertion, and to guide the signal in the proper direction. The standard covers line traps in which the main coil is designed as a single-phase, air-cooled inductor of the dry type.

1.2 Purpose

This standard is vital to the application of power line carrier systems on all power lines 69 kV and above. Power-line carrier systems are used for protection systems and other communications. The line trap is part of the system that allows the carrier signal to be coupled to the power line with optimal performance.

Performance requirements will be established so that their interaction with the power system is known and performance can be predicted.

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 C84.1, American National Standard for Electric Power Systems and Equipment–Voltage Ratings (60 Hz).[1]

ANSI/NEMA CC 1, Electric Power Connection for Substations.[2]

ANSI/NEMA CC 1, Annex A, Methods of Measurement of Radio Influence Voltage (RIV) of High-Voltage Apparatus (replaced NEMA 107-1987/1993).

[1]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/).
[2]NEMA publications are available from Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112, USA (http://global.ihs.com/).