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IEEE Standard for Standard Terminal Markings and Connections for Distribution and Power Transformers

IEEE Power & Energy Society

Sponsored by the
Transformers Committee

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Abstract: Standard terminal markings and connections are described for single-phase and three phase distribution, power, and regulating transformers. For terminal markings, it covers sequence designation, external terminal designation, neutral terminal designation, grounded terminal designation, and marking of full and tap winding terminals. Additive and subtractive polarity and parallel transformer operation are described. Connections of single-phase transformers in various configurations and angular displacement of three-phase transformers to connect to various system phase displacements are covered.
Keywords: IEEE C57.12.70, transformer connection, transformer terminals, transformer polarity

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Introduction

This introduction is not part of IEEE Std C57.12.70-2011, IEEE Standard for Standard Terminal Markings and Connections for Distribution and Power Transformers.

In 1964, the first version of this standard was prepared. It replaced the material that originally appeared in a separate section of Part O of NEMA TR 1-1962, Transformers, Regulators, and Reactors. Moreover, it was intended that this standard would supersede the terminal markings and connections provided in ASA C6.1-1956, Standard Terminal Markings for Electric Apparatus.

After reaffirmation of this standard in 1971, it was revised and published as IEEE Std C57.12.70-1978. Significant revisions to this edition involved utilizing modern terminology, addition of zigzag phasor diagrams, inclusion of figures showing additional grounding connections, addition of figures showing "standard" and "reverse" arrangement commonly used in unit substations, and inclusion of a new "preferred" connection arrangement for three-phase delta-connected windings with a mid-tap in one winding.

In 2000, the standard was again revised as IEEE Std C57.12.70-2000 (Reaff 2006). The primary intent of that revision was to update the standard to comply with the approved style of currently published standards, to update reference standards, and to add terminal markings for padmounted compartmental transformers.

In this version of the standard, the references have again been updated. Also an informative Annex A, Winding Connections Details and Explanations was added to introduce the clock face notation method for the transformer winding connection symbols. This is similar to the IEC method outlined in IEC standard 60076-1. A bibliography has been added in Informative Annex B. Further, the standard has again been updated to match current Style Guide requirements, text was generally revised, and many figures have been redrawn to improve clarity.

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Contents

IEEE Standard for Standard Terminal Markings and Connections for Distribution and Power Transformers

1. Overview

1.1 Scope

This standard defines the terminal markings and connections for distribution, power, and regulating transformers covered in the IEEE C57 series of standards, guides, and recommended practices.

1.2 Purpose

The standard provides a consistent method for terminal markings and connections for single-phase and three-phase distribution, power, and regulating transformers. It designates terminal markings for interchangeability showing the sequence, external terminations, neutral terminations, grounded terminations, and marking of full and tap winding terminations. It also puts forth the connections of single-phase transformers in various configurations and describes the angular displacement of three-phase transformers when connected to various system phase displacements.

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