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IEEE Guide for Mechanical Interchangeability of Ventilated Dry-Type Transformers

IEEE Power and Energy Society

Developed by the
Transformer Committee

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(Revision of IEEE Std C57.12.51-2008)

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Abstract: Characteristics of ventilated dry-type transformers relating to performance, limited electrical and mechanical interchangeability, as well as recommended practice for installation of equipment are set forth in this guide. Specific rating combinations are described up to 7500 kVA high-voltage class from 1.2 kV to 36 kV inclusive, and low voltage class up to 5 kV. This guide also describes certain electrical and mechanical requirements and takes into consideration certain desirable features of 60 Hz, two-winding, three-phase, ventilated dry-type transformers. Clause 9 through Clause 11 describe other requirements or alternatives that may be specified for some applications.

Keywords: ambient temperature, construction, dry-type transformer, electrical, forced-air cooled, grounding, IEEE C57.12.51™, impedance, insulation level, jacking, mechanical, performance, rating, surge arresters, taps, temperature device, temperature rise, tests, transformer, transformer enclosure, unit substation, winding temperature

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Introduction

This introduction is not part of IEEE Std C57.12.51-2019, IEEE Guide for Mechanical Interchangeability of Ventilated Dry-Type Transformers.

Historically, two existing documents (IEEE Std C57.12.51™ and IEEE Std C57.12.50™ provided requirements for specific voltage and power ranges of dry-type transformers. They were referred to as ‘product standards’ when referenced in other IEEE documents such as IEEE Std C57.12.01™. It was decided by the Dry-Type Subcommittee that IEEE Std C57.12.51 and IEEE Std C57.12.50 were similar enough in overall requirements and scope that the two would be combined. The resulting document would keep the designation of IEEE Std C57.12.51 and would be simplified, where possible, and refer directly to IEEE Std C57.12.01 when possible to keep the documents in sync.

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IEEE Guide for Mechanical Interchangeability of Ventilated Dry-Type Transformers

1. Overview

1.1 Scope

This guide sets forth characteristics of ventilated dry-type transformers relating to performance, limited electrical and mechanical interchangeability, as well as recommended practice for installation of the equipment described, and to assist in the proper selection of such equipment. Specific rating combinations are described up to a base of 7500 kVA inclusive, high-voltage class from 1.2 kV to 36 kV inclusive, and low-voltage class up to 5 kV.

This guide does not apply to other types of transformers such as specialty, sealed dry-type, pad-mounted dry-type, instrument, step and induction voltage regulators, arc-furnace, mining, testing, welding, and rectifier transformers.

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 C57.12.55™, American National Standard for Transformers—Used in Unit Installations, Including Unit Substations—Conformance Standard.[1]

IEEE Std C57.12.01™, IEEE Standard for General Requirements for Dry-Type Distribution and Power Transformers.[2,3]

IEEE Std C57.12.70™, IEEE Standard for Terminal Markings and Connections for Distribution and Power Transformers.

IEEE Std C57.12.80™, IEEE Standard Terminology for Power and Distribution Transformers.

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