C57.12.90™

IEEE Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers

IEEE Power & Energy Society

Sponsored by the
Transformers Committee

IEEE
3 Park Avenue
New York, NY 10016-5997, USA

15 October 2010

IEEE Std C57.12.90™-2010
(Revision of
IEEE Std C57.12.90-2006)

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Approved 17 June 2010

IEEE-SA Standards Board

Abstract: Methods for performing tests specified in IEEE Std C57.12.00™ and other standards applicable to liquid-immersed distribution, power, and regulating transformers are described. Instrument transformers, step-voltage and induction voltage regulators, arc furnace transformers, rectifier transformers, specialty transformers, grounding transformers, and mine transformers are excluded. This standard covers resistance measurements, polarity and phase-relation tests, ratio tests, no-load loss and excitation current measurements, impedance and load loss measurements, dielectric tests, temperature tests, short-circuit tests, audible sound level measurements, and calculated data.

Keywords: tests, transformers, transformer tests

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PDF: ISBN 978-0-7381-6381-9 STD96097
Print: ISBN 978-0-7381-6382-6 STDPD96097

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Introduction

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When this standard is used on a mandatory basis, the word *shall* indicates mandatory requirements, and the words *should* and *may* refer to matters that are recommended or permissive, but not mandatory. The word *must* has been removed from this revision and replaced with *shall* to conform with the *IEEE Standards Style Manual*.

This standard is on a continuous revision cycle and is constantly being reviewed and updated. One can go to the website www.transformerscommittee.org to seek out information on select activities and participate in upcoming changes. Following is a brief summary of the noneditorial changes in this revision:

- Normative references and bibliography. Throughout this document, dated references have been changed to undated references, except in cases where a specific clause, table, figure, or equation is cited.
- Clause 5 introductory paragraph and 5.1.1 and 5.1.2. These passages have been slightly revised:
- Subclause 5.3. This subclause on resistance measurement methods has been changed to promote the voltmeter-ammeter method over the bridge method.
- Subclause 5.4. Resistance measurements connections and reporting have been added.
- New subclause 9.5.5. This new subclause provides a test method for zero-sequence impedance measurement on transformers with interconnected windings.
- Subclause 10.2.2.1. This subclause on switching impulse wave polarity has been changed to require negative polarity instead of an option between positive or negative polarity.
- Subclause 10.3.1.1. This subclause on full-wave impulse testing has been completely rewritten.
- Subclause 10.3.1.3. This subclause on chopped-wave impulse testing has been completely rewritten.
- Subclause 10.3.2.5. This subclause on nonlinear protective devices has been completely rewritten.
- Subclauses 10.5 to 10.10. These subclauses on low-frequency tests have been revised.
- Former subclause 10.10.5. This subclause on temperature correction factors of insulation power factor has been deleted.
- New Annex B. This normative annex presents frequency conversion factors for conversions from 50 Hz to 60 Hz and vice versa.

Technical revisions were prepared by various groups within the IEEE Transformers Committee and have been balloted and approved by these groups through the subcommittee level.

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1. Overview

1.1 Scope

This standard describes methods for performing tests specified in IEEE Std C57.12.00™ and other standards applicable to liquid-immersed distribution, power, and regulating transformers.[1] It is intended for use as a basis for performance and proper testing of such transformers.

This standard applies to all liquid-immersed transformers, except instrument transformers, step-voltage and induction voltage regulators, arc furnace transformers, rectifier transformers, specialty transformers, grounding transformers, and mine transformers.

Transformer requirements and specific test criteria are not a part of this standard, but they are contained in appropriate standards, such as IEEE Std C57.12.00, ANSI C57.12.10 [B1],[2] IEEE Std C57.12.20™, and IEEE Std C57.12.40™ [B10], or in user specifications.

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

[2] The numbers in brackets correspond to the numbers in the bibliography in Annex C.