

IEEE Standard for General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers

IEEE Power and Energy Society

Developed by the
Transformers Committee

IEEE Std C57.12.00™-2021
(Revision of IEEE Std C57.12.00-2015)

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Abstract: Electrical and mechanical requirements for liquid-immersed distribution and power transformers, and autotransformers and regulating transformers; single-phase and polyphase, with voltages of 601 V or higher in the highest voltage winding, are set forth. This standard is a basis for the establishment of performance, and limited electrical and mechanical interchangeability requirements of equipment are described; it is also a basis for assistance in the proper selection of such equipment. The requirements in this standard apply to all liquid-immersed distribution, power, and regulating transformers except the following: instrument transformers, step voltage and induction voltage regulators, arc furnace transformers, rectifier transformers, specialty transformers, grounding transformers, mobile transformers, and mine transformers.

Keywords: autotransformers, distribution transformers, electrical requirements, IEEE C57.12.00™, mechanical requirements, power transformers, regulating transformers

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Introduction

This introduction is not part of IEEE Std C57.12.00-2021, IEEE Standard for General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers.

Where applicable, editorial changes have been incorporated into this revision. Sentence structure and punctuation have been edited to improve clarity and conciseness. Also, editorial changes have been made to conform to the *2021 IEEE SA Standards Style Manual*.¹ Some changes have also been made to correct errors in previous revisions. When applicable, references to other standards have been updated.

A summary of the major changes is listed in sequential order, as follows:

- a) IEEE Std 1427™ added to Clause 2, Normative references.
- b) Clause 5.7.2, Angular displacement between voltages of windings for three-phase transformers, has been restructured for clarity.
- c) Note f to Table 6, Nameplate information, was revised to more clearly state which basic lightning impulse insulation levels (BIL) are to be shown on the nameplate.
- d) Figure 4 was revised to remove the metric M22 thread alternative because it is not interchangeable with the imperial thread 7/8 in-14, the prevalent usage in North America.
- e) Subclause 6.7.2.1, Grounding of wound cores, was added to emphasize proper core grounding for certain types of transformers utilizing wound cores. A corresponding note was added in Table 17 to specify a special partial discharge test to confirm the adequacy of the core grounding.
- f) Subclause 6.8, Minimum external clearances of transformer live parts, has been completely rewritten and a new Table 10 introduced.
- g) The equations and list of variables in 7.4 have been rearranged to improve clarity.
- h) Equation (14) and Equation (15), for calculating the temperature of windings during a short circuit in 7.4, have been revised due to an earlier metrification conversion error.
- i) An additional test requirement for measuring load loss at the minimum and maximum kVA has been added in Table 17.
- j) The note which describes audible sound level requirements in Table 17 has been moved to a new 8.2.5 for better clarity. Similarly, Annex C has been completely rewritten to incorporate no-load sound pressure levels from NEMA TR1, and to add reference sound pressure levels for load noise.
- k) Annex C, Audible sound pressure levels, has been changed to normative material.
- l) Annex D, Bibliography, has been updated.

Revisions of individual clauses (now modified) were prepared by separate groups within the Transformers Committee. Those clauses were balloted independently in the Working Groups, according to applicable rules and procedures of the Transformers Committee P&P Manual.

Suggestions for improvement resulting from use of this standard will be welcomed.

¹ Available at <https://development.standards.ieee.org/myproject/Public/mytools/draft/styleman.pdf>.