

American National Standard Requirements for Ventilated Dry-Type Distribution Transformers, 1 to 500 kVA, Single-Phase, and 15 to 500 kVA, Three-Phase, with High-Voltage 601 to 34 500 Volts, Low-Voltage 120 to 600 Volts

Approved 8/15/80

American National Standards Institute, Inc.

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

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Print: ISBN 0-7381-3643-3 SH95118
PDF: ISBN 0-7381-3644-1 SS95118

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Foreword

(This Foreword is not a part of American National Standard Requirements for Ventilated Dry-Type Distribution Transformers, 1 to 500 kVA, Single-Phase, and 15 to 500 kVA, Three-Phase, with High-Voltage 601 to 34 500 Volts, Low-Voltage 120 to 600 Volts, ANSI C57.12.50-1981.)

This new dry-type transformer standard describes ventilated dry-type transformers with self-cooled kVA ratings 1–500, and high voltages 2400–34 500 volts. (Forced-air-cooled ratings for certain sizes are listed in Part II.) It is also applicable from 601–2400 volts, but not for high voltages 600 volts and below, since American National Standards Committee C89 on Specialty Transformers has responsibility for transformers with high voltages 600 volts and below. This standard is part of a new series of standards for dry-type transformers that also includes American National Standard General Requirements for Dry-Type Distribution and Power Transformers, ANSI/IEEE C57.12.01-1979; American National Standard Test Code for Dry-Type Distribution and Power Transformers, ANSI/IEEE C57.12.91-1979; American National Standard Requirements for Ventilated Dry-Type Power Transformers, 501 kVA and Larger, Three-Phase, with High Voltage 601–34 500 Volts, Low-Voltage 208Y/120 to 4160 Volts, ANSI C57.12.51-1981; and American National Standard Requirements for Sealed Dry-Type Power Transformers, 501 kVA and Larger, Three-Phase, with High-Voltage 601–34 500 Volts, Low-Voltage 208Y/120 to 4160 Volts, ANSI C57.12.52-1981.

Dry-type transformers have been covered in the past by a variety of documents, including American National Standard General Requirements for Distribution, Power, and Regulating Transformers, ANSI C57.12.00-1973; American National Standard Test Code for Distribution, Power, and Regulating Transformers, ANSI C57.12.90-1973; American National Standard Dry-Type Transformers for General Applications, ANSI/NEMA ST 20-1972; and Commercial, Institutional, and Industrial Dry-Type Transformers, NEMA TR 27-1965 (R1976). The new standards are the result of an effort encompassing the interests of users, manufacturers, and others dedicated to developing voluntary consensus standards primarily for dry-type transformers. They have various significant changes, including higher BILs (for most voltages), more stringent and meaningful short-circuit requirements, improved descriptions of “usual” and “unusual” service conditions, and numerous other improvements. The new standards should be easier and more efficient to use, since they are arranged according to the sequence in which information is normally needed. ANSI C57.12.50-1981 includes customary units and metric (SI) units, in accordance with ANSI policy. Sound levels were discussed in the preparation of this standard, but are not included at present. As a matter of information, NEMA TR 1-1974, Transformers, Regulators, and Reactors, includes data concerning dry-type transformer sound levels.

It should be noted that ANSI C57.12.50-1981 covers some of the scope of ANSI C89.2-1972 (NEMA ST 20-1972). It is understood from the chairman of American National Standards Committee on Specialty Transformers, C89, that the committee will delete that portion of the scope of C89.2 relating to transformers 601 volts and above to eliminate duplication.

This standard is a voluntary consensus standard. Its use is mandatory only when required by a duly constituted legal authority or when specified in a contractual relationship. To meet specialized needs and to allow innovation, specific changes are permissible when mutually determined by the user and the producer, provided such changes do not violate existing laws and are considered technically adequate for the function intended.

When this document is used on a mandatory basis, the word “shall” indicates mandatory requirements, and words “should” and “may” refer to matters which are recommended and permitted, respectively, but not mandatory.

The applicable ANSI rules and procedures for the preparation and approval of voluntary consensus standards have been followed. These specify procedures for voting, review and attempted reconciliation of dissenting viewpoints, a 60-day public review period, and final review and approval by the ANSI Board of Standards Review.

Suggestions for improvement of this standard will be welcome. They should be sent to the American National Standards Institute, Inc, 1430 Broadway, New York, N.Y. 10018.

This standard was processed and approved for submittal to ANSI by American National Standards Committee on Transformers, Regulators, and Reactors, C57. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, the C57 Committee had the following members:

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1. Scope

1.1

This standard is intended to set forth characteristics relating to performance, limited electrical and mechanical interchangeability, and safety of the equipment described, and to assist in the proper selection of such equipment.

1.2

This standard describes certain electrical and mechanical characteristics and takes into consideration certain safety features of 60-Hz, two-winding, ventilated dry-type transformers with self-cooled ratings 1 to 500 kVA, single-phase, and 15 to 500 kVA, three-phase, inclusive; high-voltage 601 to 34 500 volts, and low-voltage 120 to 600 volts, inclusive; generally used for step-down purposes. (Forced-air-cooled ratings for certain sizes are listed in Part II.)

1.3

This standard does not apply to other types of transformers, such as specialty, ventilated dry-type 501 kVA and larger, sealed dry-type, pad-mounted dry-type, liquid immersed, instrument, regulating, furnace, mine, and rectifier transformers. Transformers with high voltage 600 volts or less are excluded.

1.4

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 and permitted, respectively, but not mandatory.

NOTE — The Foreword of this standard describes the circumstances under which the document may be used on a mandatory basis.

1.5

Part I of this standard describes basic electrical and mechanical requirements. Part II describes other requirements or alternatives which may be specified for some applications.

2. Related Standards and Guides

2.1 General.

All requirements, definitions, and tests, except as specifically covered in this standard, shall be in accordance with the American National Standards listed below (see 2.3). When referred to in this document, standards are identified by designation and year (for example, ANSI/IEEE C57.12.01-1979):

American National Standard Dictionary of Electrical & Electronics Terms, ANSI/IEEE 100-1977

American National Standard General Requirements for Dry-Type Distribution and Power Transformers, ANSI/IEEE C57.12.01-1979

American National Standard Guide for Application of Transformer Connections in Three-Phase Distribution Systems, ANSI/IEEE C57.105-1978

American National Standard Guide for Application of Valve-Type Lightning Arresters for Alternating-Current Systems, ANSI C62.2-1980

American National Standard National Electrical Code, ANSI/NFPA 70-1981

American National Standard Guide for Installation and Maintenance of Dry-Type Transformers, ANSI Appendix C57.94 (1958)

American National Standard Requirements for Instrument Transformers, ANSI/IEEE C57.13.1978

American National Standard Requirements for Sealed Dry-Type Power Transformers, 501 kVA and Larger, Three-Phase; with High-Voltage 601-34 500 Volts, Low-Voltage 208Y/120 to 4160 Volts, ANSI C57.12.52-1981

American National Standard Requirements for Ventilated Dry-Type Power Transformers, 501 kVA and Larger, Three-Phase; with High-Voltage 601-34 500 Volts, Low-Voltage 208Y/120 to 4160 Volts, ANSI C57.12.51-1981

American National Standard Terminal Markings and Connections for Distribution and Power Transformers, ANSI C57.12.70-1978

American National Standard Terminology for Distribution and Power Transformers, ANSI/IEEE C57.12.80-1978

American National Standard Test Code for Dry-Type Distribution and Power Transformers, ANSI/IEEE C57.12.91-1979

American National Standard for Unified Inch Screw Threads (UN and UNR Thread Forms). ANSI B1.1-1974

American National Standard Voltage Ratings for Electric Power Systems and Equipment (60 Hz), ANSI C84.1-1977 and C84.1a-1980