

American National Standard for Transformers

Underground-Type Three-Phase Distribution Transformers, 2500 kVA and Smaller; High Voltage, 34 500 GrdY/19 920 Volts and Below; Low Voltage, 480 Volts and Below — Requirements

Secretariat

**Institute of Electrical and Electronics Engineers
of the
National Electrical Manufacturers Association**

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American National Standard

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Foreword

(This foreword is not part of American National Standard C57.12.24-1994.)

Accredited Committee on Transformers, Regulators, and Reactors, C57, has for a number of years been developing and correlating standards on transformers and regulators. The data used in this work have been gathered from many sources, including the standards of the Institute of Electrical and Electronics Engineers and the National Electrical Manufacturers Association, reports of the Edison Electrical Institute, and others.

This standard on three-phase underground distribution transformers was prepared by the Subcommittee on Underground Secondary Network Transformers, C57.12.4, and revises ANSI C57.12.24-1988

Suggestions for improvement of this standard will be welcome. They should be sent to the National Electrical Manufacturers Association, 2101 L Street, NW, Washington, DC 20037.

The standard was processed and approved for submittal to ANSI by the Accredited 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.

NOTE — Refer to the latest Federal Regulations concerning polychlorinated biphenyls (PCB) contamination in transformers.

1.2

This standard describes certain electrical and mechanical characteristics and takes into consideration certain safety features of three-phase, 60-Hz, liquid-immersed, self-cooled, underground-type distribution transformers rated 2500 kVA and smaller with high voltages of 34 500GrdY/19 920 volts and below and with low voltages of 480 volts and below. These transformers are generally used for step-down purposes from an underground primary cable supply and are suitable for occasional submerged operation.

1.3

This standard does not cover the electrical and mechanical requirements of any accessory devices that may be supplied with the transformer.

2. Normative references

When an American National Standard referred to in this document is superseded by a revision approved by the American National Standards Institute, Inc., the revision shall not apply. The referenced standard and the specific

referenced edition shall be the applicable referenced standard until the new version of the referenced document is incorporated by formal action or appropriate revision of the citing standard.

ANSI C57.12.70-1978 (R 1987), *Terminal markings and connections for distribution and power transformers*

ANSI C84.1-1989, *Electrical power systems and equipment — Voltage ratings (60 Hertz)*

ANSI/ASME B1.1-1989, *Unified inch screw threads (un and unr thread form)*

ANSI/IEEE 100-1988, *Dictionary of electrical and electronics terms*

ANSI/IEEE 386-1985, *Separable insulated connector systems for power distribution systems above 600 V*

ANSI/IEEE C57.12.00-1987, *General requirements for liquid-immersed distribution, power, and regulating transformers*

ANSI/IEEE C57.12.80-1978 (R 1986), *Terminology for power and distribution transformers*

ANSI/IEEE C57.12.90-1987, *Test code for liquid-immersed distribution, power, and regulating transformers and guide for short-circuit testing of distribution and power transformers*

ANSI/IEEE C57.91-1981, *Distribution transformers rated 500 kVA and less with 55°C or 65°C average winding rise, guide for loading mineral oil-immersed overhead and pad-mounted*

3. Ratings

3.1 Kilovolt-ampere ratings

3.1.1

Kilovolt-ampere (kVA) ratings are continuous and are based on not exceeding a 55°C average winding temperature rise and a 70°C hottest-spot temperature rise. The temperature rise of the insulating liquid shall not exceed 55°C when measured near the top of the tank. The transformers shall have a 65°C temperature-rise insulation system.

The kilovolt-ampere ratings shall be as follows:

75	300	1500
122 1/2	500	2000
150	750	2500
225	1 000	

3.1.2

Transformers conforming to this standard shall be suitable for continuous operation at rated kVA, provided that the temperature of the cooling air (enclosure ambient temperature) does not exceed 50°C and the average temperature of