

AS 1243—1982

Australian Standard<sup>®</sup>

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**Voltage transformers for  
measurement and protection**

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Represented on the committee which was responsible for the preparation of this standard were the following:

Australian Electrical and Electronic Manufacturers Association

CSIRO, National Measurement Laboratory

Electrical testing laboratories

Electricity Supply Association of Australia

Railways of Australia Committee

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This standard, prepared by Committee EL/13, Measurement and Protection Transformers, was approved on behalf of the Council of the Standards Association of Australia on 4 December 1981, and was published on 19 April 1982.

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*This Standard was issued in draft form for comment as DR 80158 to 80162.*

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## PREFACE

This edition of this standard was prepared by the Association's Committee on Measurement and Protection Transformers to supersede AS 1243—1972.

The standard has been revised in recognition of developments since 1972 and in order both to further its alignment with IEC standards and to improve comprehension by increased separation of less common aspects from general aspects.

This edition differs from the first edition as follows:

- (a) It makes reference to AS 1824, Insulation Coordination, Part 1 — Basic Principles, Standard Insulation Levels and Test Procedures, and AS 1931, High Voltage Testing Techniques, Part 1 — General Definitions, Test Requirements, Test Procedures and Measuring Devices.
- (b) The following (previously misleading) terms have been changed:
  - (i) 'Non-earthable' voltage transformers are now referred to as being 'uniformly insulated' (see Clause 1.3.2.8).
  - (ii) 'Earthable' voltage transformers are now referred to as being 'non-uniformly insulated' (see Clause 1.3.2.9).
- (c) The term 'reference primary voltage' has been discarded because it was not widely understood. The term was previously introduced to refer to the phase-to-neutral voltage associated with the rated phase-to-phase voltage of three-phase Category B or Designation R voltage transformers. In this edition 'rated primary voltage' has been redefined for this type of voltage transformer (see Clause 13.3.8).
- (d) The whole voltage transformer is now required to withstand the thermal effects of the most onerous combination of rated voltage factor and rated duration assigned to any secondary winding.
- (e) Particular requirements for single-phase electromagnetic voltage transformers are now specified separately (see Section 2).
- (f) Category of performance and secondary residual voltage are now restricted to three-phase voltage transformers (see Section 4).
- (g) Particular requirements for Designation L voltage transformers are now specified separately (see Section 5).
- (h) The symbol for voltage is now  $U$  in accordance with AS 1046, Part 1, published in 1978. Previously it was  $V$ . However, the symbol  $V$  is retained for the unit volt (see AS 1000).
- (j) The measurement of partial discharges and their permissible levels have been specified as a routine test for certain HV voltage transformers (see Clause 1.14.5).
- (k) A method for measuring radio influence voltage is included but no limits are specified (see Clause 1.16).
- (l) Mention is made of measurements of dielectric dissipation factor (tangent delta) but no recommendations are included (see Clause 1.14.7).

This standard also differs from the IEC standard for voltage transformers in such areas as rated voltage factor for continuous operation, phase-error limits, and ranges of compliance with error limits. In addition IEC standards do not specify detailed requirements for three-phase voltage transformers.

In the preparation of this standard reference was made to the following publications:

IEC 186 Voltage Transformers (First edition (1969) including Supplement A (1970) and Amendment No. 1 (1978))

IEC 358 Coupling Capacitors and Capacitor Dividers

BS 3941 Voltage Transformers

Acknowledgment is made of the assistance received therefrom.

In the application of this standard, reference may be necessary to the following Australian, IEC and British standards:

AS 1000 The International System of Units (SI) and Its Application

AS 1013 Shunt Capacitors for Connection to Power Frequency Systems

AS 1018 Recommendations for Partial Discharge Measurements

AS 1024 Direct Recording Electrical Measuring Instruments and Their Accessories

AS 1042 Direct-acting Indicating Electrical Measuring Instruments and Their Accessories

AS 1046 Letter Symbols for Use in Electrotechnology Part 1—General

AS 1052 Electromagnetic Interference Measuring Equipment Part 2—Equipment for the Frequency Range 0.15 MHz to 1000 MHz

AS 1255 Methods of Test for Electrical Characteristics of Solid Plastics Insulating materials Part 4 —Method 4—Determination of the Permittivity and Dielectric Dissipation Factor at Power, Audio and Radio Frequencies up to 300 MHz

AS 1265 Bushings for Alternating Voltages above 1000 V

AS 1284 Electricity Meters

AS 1306 High Voltage Isolators (Disconnectors) and Earthing Switches

AS 1384 Transducers for Electrical Measurements

AS 1767 Insulating Oil for Transformers and Switchgear

AS 1824 Insulation Coordination Part 1—Basic Principles, Standard Insulation Levels and Test Procedures

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|---------|---|----------|---|
| AS 1931 | High Voltage Testing Techniques<br>Part 1—General Definitions, Test<br>Requirements, Test Procedures<br>and Measuring Devices | AS C320* | Classification of Insulating Materials for<br>Electrical Machinery and Apparatus on the<br>Basis of Thermal Stability in Service          |
| AS 2006 | High Voltage Alternating Current<br>Circuit-breakers  | IEC 44   | Instrument Transformers<br>Part 4—Measurement of Partial Discharges   |
| AS 2481 | All-or-nothing Electrical Relays<br>(Instantaneous and Timing Relays)   | IEC 358  | Coupling Capacitors and Capacitor Dividers  |
| AS 2532 | Current and Voltage Transformers for<br>Measurement and Protection —<br>Measurement of Partial Discharges                     | IEC 445  | Identification of Apparatus Terminals and<br>General Rules for a Uniform System of<br>Terminal Marking, Using an Alphanumeric<br>Notation |
| AS 3100 | Approval and Test Specification for<br>Definitions and General Requirements for<br>Electrical Materials and Equipment         | IEC 481  | Coupling Devices for Power Line Carrier<br>Systems  |
|         |   | BS 1858  | Bitumen Based Filling Compounds for<br>Electrical Purposes  |

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\* Superseded by AS 2768—1985, Electrical Insulating Materials—Evaluation and Classification Based on Thermal Endurance

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