AS 1675—1986

Australian Standard®

Current transformers—Measurement and protection

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Current transformers—Measurement and protection

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PREFACE

This standard was prepared by the Association's Committee on Measurement and Protection Transformers, to supersede AS 1675—1974.

In the preparation of this standard, consideration was given to IEC 185, Current Transformers. Acknowledgement is made of the assistance received therefrom.

This edition differs substantially from IEC 185 as follows:

(a) *For measurement current transformers*. Although designations and classifications used are the same as in IEC, the CTs are quite different because the power factor of the test burdens, the limits of error, and the test conditions are substantially different.

(b) *For protection current transformers*. Although the requirements are similar, the designations are completely different (see Appendix H). Also the interturn overvoltage test on secondary windings is more arduous than IEC for certain CTs.

This edition differs from AS 1675—1974 as follows:

(i) Requirements for each class of current transformer (CT) are specified separately and directly.

(ii) For measurement CTs, accuracy requirements for Class ME are displayed in a similar format to those for Class M to facilitate comparison. Class ME is no longer referred to as 'extended range' (see Clause 2.3). For Class 1M CTs, limits of variations in current and phase errors have been deleted.

(iii) For protection CTs, the previously used terms 'low-reactance' and 'high-reactance', have been discarded as being misleading (see Clause 3.3). For Class PCTs, the designated (previously 'declared') composite error must now not be exceeded, however measured.

(iv) A warning is given concerning the use of a Class P CT on a protection scheme requiring good transient response. A Class PL CT is intended for such use (see Clause 3.3 and Appendix B, Paragraph B2.4).

(v) For Class PS CTs, three possibilities are recognized to allow for variations to Classes P and PL as well as for CTs not easily definable in that manner (see Clause 3.3).

(vi) Reference is made to updated standards on insulation coordination and high voltage testing techniques.

(vii) The symbol for voltage is now *U* in accordance with AS 1046, Part 1—1978. Previously it was *V*.

(viii) The measurement of partial discharges and their per-missible levels have been specified as a routine test for certain high-voltage current transformers (see Clause 1.13.10).

(ix) Methods for measuring radio influence voltage and for checking thermal stability are included but no limits are specified (see Clause 1.15).

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
CURRENT TRANSFORMERS—MEASUREMENT AND PROTECTION

SECTION 1. SCOPE AND GENERAL REQUIREMENTS

1.1 SCOPE. This standard specifies requirements for current transformers (herein referred to as CTs) for use with electrical measuring instruments and electrical protection devices.

NOTE: Such instruments and devices are covered by the following standards: AS 1024, AS 1042, AS 1284, AS 1384 and AS 2481.

The standard also applies to CTs suitable for operating measuring relays and circuit-breaker trip coils, and to standard CTs used in the testing of CTs.

NOTES:

1. In order to facilitate the specification and purchase of CTs, the standard also lists information which should be supplied with enquiry and order (see Appendix A).
2. Particular attention is drawn to the Foreword to AS 1384 concerning possible peculiarities in the burdens imposed on CTs by certain transducers.
3. Guidance in the application of CTs is given in Appendix B.

1.2 APPLICATION. All CTs shall comply with the relevant requirements of Section 1, and with the requirements of the following Sections, as applicable:

(a) Measurement CTs . . . . . Section 2.

(b) Protection CTs . . . . . Section 3.

1.3 REFERENCED DOCUMENTS. A list with titles of the standards referred to in this standard is given in the Annex.

1.4 DEFINITIONS.

1.4.1 General. For the purpose of this standard, the following definitions apply. For convenience, the definitions are listed in aspect groupings as follows:

Definitions relating to—	*See Clause*
Construction	1.4.2
Performance	1.4.3
Service conditions of a three-phase system	1.4.4

NOTE: Definitions are also listed in the Index.

1.4.2 Definitions relating to construction. (See Fig 1.1)

1.4.2.1 *Current transformer (CT)*—a transformer, for use with electrical measuring instruments and/or electrical protection devices, for the transformation of current and in which the current in the secondary winding is, within prescribed error limits, proportional to and in phase with the current in the primary winding.

1.4.2.2 *Measurement CT*—a CT intended for use with indicating instruments, integrating meters and similar devices.

1.4.2.3 *Protection CT*—a CT intended for use with electrical protection devices.

1.4.2.4 *Wound-primary CT*—a CT having a fixed primary winding comprising one or more turns mechanically encircling the core. The primary winding is completely insulated and permanently assembled on the core as an integral part of the structure.

1.4.2.5 *Bar-primary CT*—a CT having a fixed, insulated, straight primary conductor in the form of a bar or tube integral with the core and the secondary-winding assembly. The primary conductor is the equivalent of a single primary turn.

1.4.2.6 *Bushing-type CT*—a CT having neither primary winding nor insulation for a primary winding. This type of CT is for use with a fully-insulated conductor as the primary winding.

1.4.2.7 *Window-type CT*—a CT having no primary winding as an integral part of the structure. Complete or partial primary insulation may be provided in the window, through which one or more turns of line conductor can be threaded to provide the primary winding.

1.4.2.8 *Post-type CT*—a unit comprising one or more CTs having a common primary conductor and an insulator (the post) usually arranged as one of the following:

(a) *Dead-tank type*—with core(s) and secondary winding(s) located at the bottom of the insulator around the primary conductor, the major insulation being applied to the primary conductor.

(b) *Live-tank type*—with core(s) and secondary winding(s) supported at the top of the insulator housing, the primary conductor being either passed straight through or wound around the core(s), the major insulation being applied to the core assembly and secondary leads.

1.4.2.9 *Multiple-core CT*—a unit comprising more than one CT, each core being linked with a common primary winding.

1.4.2.10 *Multiple-secondary CT*—a CT having more than one secondary winding on a common core.

NOTE: See Appendix B, Paragraph B7 for guidance.

1.4.2.11 *Multiple-primary CT*—a CT having more than one primary winding on a common core.

NOTE: A summation CT is constructed in this way.

1.4.2.12 *Multiple-ratio CT*—a CT from which more than one transformation ratio can be obtained by the use of taps on the primary or secondary windings or both, or by series/parallel connection of separate primary or secondary windings on a common core, or by other means.

1.4.2.13 *Interposing CT*—a CT which is intended to amend the ratio of a main CT by having its primary winding connected to the secondary winding of the main CT and its secondary winding connected to the burden. Such a CT may be double-wound or auto-wound.

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