Australian Standard®

Electricity metering

Part 1: General purpose induction watthour meters

This Australian Standard was prepared by Committee EL/11, Electricity Metering Equipment. It was approved on behalf of the Council of Standards Australia on 27 September 1990 and published on 11 February 1991.

The following interests are represented on Committee EL/11:

Australian Electrical and Electronic Manufacturers' Association

Confederation of Australian Industry

Electricity Supply Association of Australia

Review of Australian Standards. *To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.*

Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

Australian Standard®

Electricity metering

Part 1: General purpose induction watthour meters

First published in part as AS C39—1927T.
Second edition 1942.
Revised and redesignated AS C39.1—1963.
Revised and redesignated AS 1284.1—1973.
Second edition 1985.

AS C39.3 first published 1965.
Revised and redesignated AS 1284.3—1973.

AS 1284.1—1985 and part of AS 1284.3—1973
revised, amalgamated and redesignated AS 1284.1—1991.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140
ISBN 0 7262 6603 5

PREFACE

This Standard was prepared by the Standards Australia Committee on Electricity Metering Equipment to supersede AS 1284.1—1985, *Electricity meters*, Part 1: *General purpose watthour meters*, and to introduce specific requirements for plug-in meters and for multi-rate meters, the latter being based on requirements for two-rate meters in AS 1284.3—1973, *Electricity meters*, Part 3: *Alternating current watthour meters of two-rate and energy-demand types.*

AS 1284, (retitled) *Electricity Metering*, is published in four Parts as follows:

AS		
1284.1	Part 1:	General purpose induction watthour meters (this Standard)
1284.2	Part 2:	Portable alternating current rotating standard watthour meters
1284.3	Part 3:	Induction watthour meters—Energy demand type
1284.4	Part 4:	Socket mounting system

Other Parts of AS 1284 are being drafted.

Due consideration was given to aligning this Standard with IEC 521(1988), *Class 0.5, 1 and 2 alternating-current watthour meters.* However, the extent to which this was practicable was limited owing to the following considerations:

(a) Statutory requirements under which many supply authorities operate require that the accuracy with which electricity supply to consumers is measured be within 2 percent under practically all operating conditions. A meter designed to comply with the Class 2 error limits in IEC 521 might not comply with the above requirements as the IEC standard permits the meter to be in error by more than 2 percent under certain normal operating conditions.

(b) On the other hand, adoption of the Class 1 error limits in IEC 521 was deemed to be unnecessary and the increased cost of meters made to such limits unwarranted.

(c) Since 1973, repeated requests for assured capability to maintain accuracy over long service periods for meters used for consumer metering in Australia have resulted in improvements in the design and testing of meters now being purchased. These are already of a higher standard than would be necessary to comply with IEC 521, Class 2.

(d) Australian environmental conditions are extreme in many cases e.g. exposure to strong sunlight, weathering, high humidity, dust, and service costs associated with recalibration are relatively high, thus justifying more stringent requirements to ensure long-term stability.

The Standard specifies requirements for meters with the objective of ensuring that they will generally be accurate to within 2 percent for periods in excess of 20 years under harsh environmental conditions. To allow for drift in calibration known to occur over long periods of service, some of the limits specified in this Standard are more stringent than those for IEC 521, Class 2.

The Standard adopts the single classification 'general purpose' for meters intended for domestic, commercial and general industrial use and thus avoids confusion with the IEC accuracy classifications for which the criteria are different.

A need is recognized for limited numbers of meters of higher accuracy for use in much less onerous field conditions. It is considered that this can be adequately covered by specifying compliance with IEC 521 (Class 0.5 or Class 1) or with (the Report) IEC 687 (1980), *Static watthour meters. Metrological specifications for Classes 0.2 S and 0.5 S.*

As in the 1985 edition, the fastest-moving pointer is required to rotate clockwise on increasing registration.

CONTENTS

STANDARDS AUSTRALIA

Australian Standard
Electricity metering

Part 1: General purpose induction watthour meters

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard specifies requirements for general purpose single-rate and multi-rate induction watthour meters (hereinafter referred to as 'meters') for the measurement of 50 Hz a.c. electrical energy in domestic, industrial or commercial premises.

The Standard specifies terminal arrangements and connections for bottom-connected meters, also contact blade arrangements and connections for single-element single-phase 2-wire plug-in meters by cross-reference to AS 1284.4.

For transformer-operated meters, the standard specifies secondary registration (see Clause 2.8.1.1) and the applicability of an appropriate transformer ratio constant.

NOTES:

1. For voltage transformers and current transformers, see AS 1243 and AS 1675 respectively.
2. In order to facilitate the specification and purchase of meters, the Standard lists information which should be supplied with enquiry and order (see Appendix A).

1.2 APPLICATION For plug-in meters, this Standard shall be read in conjunction with AS 1284.4.

1.3 REFERENCED DOCUMENTS The documents referred to in this Standard are listed in Appendix B.

1.4 DEFINITIONS For the purpose of this standard, the following definitions apply (see Index for an alphabetical list of terms).

1.4.1 Definitions related to the meter

1.4.1.1 *Watthour meter (active-energy meter)*—an integrating instrument which measures active energy in watthours or in decimal multiples thereof.

1.4.1.2 *Induction meter*—a meter in which currents in fixed coils react with the currents induced in the moving element, generally a disc or discs, causing movement.

1.4.1.3 *Direct-connected meter*—a meter intended for use without an external measurement transformer, i.e. for direct connection to the circuit being metered.

1.4.1.4 *Transformer-operated meter*—a meter intended for use with one or more external measurement transformers.

1.4.1.5 *CT-operated meter*—a meter intended for use with an external current transformer (CT), as indicated on the nameplate.

1.4.1.6 *Bottom-connected meter*—a meter intended for mounting on a panel with external wiring connected directly to its terminals.

1.4.1.7 *Plug-in meter*—a meter having a base fitted with contact blades and intended for insertion in a socket.

1.4.1.8 *Multi-rate meter*—a meter with two or more registers which provide for registration at one or another tariff rate according to the time, the load, or some other variable.

1.4.2 Definitions related to components

1.4.2.1 *Voltage circuit*—the winding of the driving element and the internal connections of the meter supplied with the voltage of the circuit to which the meter is connected.

1.4.2.2 *Voltage terminal*—a terminal to which the measured voltage is applied.

1.4.2.3 *Current circuit*—the winding of the driving element and the internal connections of the meter through which flows the current of the circuit to which the meter is connected.

1.4.2.4 *Current terminal*—a terminal through which the measured current flows.

1.4.2.5 *Rotor*—the moving element of the meter upon which the magnetic fluxes of fixed windings and of braking elements act and which operates the register.

1.4.2.6 *Driving element*—a working part of the meter which produces a torque by the action of its magnetic fluxes upon the currents induced in the moving element. It generally comprises electromagnets and their control devices. Herein referred to as 'element'.