Australian Standard™

Electricity metering

Part 5: General purpose electronic watthour meters

[Modified and containing the full text of IEC 61036:1996]

This Australian Standard was prepared by Committee EL/11, Electricity Metering Equipment. It was approved on behalf of the Council of Standards Australia on 2 October 1999 and published on 10 January 2000.

The following interests are represented on Committee EL/11:

Australian Chamber of Commerce and Industry

Australian Electrical and Electronic Manufacturers Association

CSIRO – National Measurement Laboratory

Consumers Federation of Australia

Electricity Supply Association of Australia

National Standards Commission

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PREFACE

This Standard was prepared by the Standards Australia Committee EL/11, Electricity Metering Equipment, to supersede AS 1284.5—1992.

The objective of this Standard is to provide electricity utilities and manufacturers with a product specification, which could form the greater part of a purchasing specification for an electronic watthour meter.

The objective of this edition is to align closely with the second edition of IEC 61036.

This Standard is Part 5 of AS 1284, *Electricity metering*, which is published in Parts as follows:

Part 1: General purpose induction watthour meters*
Part 2: Portable alternating current rotating standard watthour meters
Part 3: Induction watthour meters—Energy demand type
Part 4: Socket mounting system
Part 5: General purpose electronic watthour meters (this Standard)
Part 6: Ripple control receivers for tariff and load control
Part 7: Internal clocks for meters and load control devices
Part 8: Polyphase multifunction demand watthour meters (Class 1)
Part 9: Electronic watthour meters (Classes 0.2 S and 0.5 S)
Part 10.1: Data exchange for meter reading, tariff and load control—Direct local data exchange via hand-held unit (HHU)—IEC Standard interface
Part 10.2: Data exchange for meter reading, tariff and load control—Direct local data exchange via hand-held unit (HHU)—ANSI Standard interface
Part 11: Single-phase multifunction watthour meters
Part 12: Polyphase multifunction (non-demand) watthour meters (Class 1)
Part 13: In-service reverification†

In January 1997, the IEC commenced numbering its Standards from 60000 by adding 60000 to the number of each existing Standard. This coordinates IEC numbering with ISO numbering. During the transition period an IEC Standard might be identified by its new number or its old number (for example, IEC 61036 or IEC 1036).

This Australian Standard is a modified adoption of IEC 61036:1996, Alternating current static watt-hour meters for active energy (classes 1 and 2). It has been reproduced from IEC 61036 and varied as indicated to take account of Australian climatic conditions and fundamental technological requirements.

Variations to are indicated at the appropriate places throughout this Standard. Strikethrough (~~example~~) identifies IEC text, tables and figures which, for the purposes of this Australian Standard, are deleted. Where Standards Australia text, table or figure is added, each is set in its proper place and identified by shading (example). Added figures are not themselves shaded, but are identified by a shaded border.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(b) In the source text 'this International Standard' should read 'this Standards Australia Standard'.

(c) A full point should be substituted for a comma when referring to a decimal marker.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annex to which they apply. A normative annex is an integral part of a Standard, whereas an informative annex is only for information and guidance.

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* In course of revision, see DR 97234.

† In course of preparation.

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INTRODUCTION

This International Standard has been prepared using IEC 521 and IEC 687 as reference standards. As many new requirements and tests had to be added, this new standard has been split into five clauses, namely:

1 Scope
2 Normative references
3 Definitions
4 Requirements
5 Tests and test conditions

For all tests which are not specified in this standard, reference must be made to existing IEC Publications.

This standard is a type test standard, in line with IEC 521 and 687. It covers the "standard meter", which will be used indoors and outdoors in big quantities world-wide. It does not deal with special executions (such as metering-part and display in separate housing). These will be covered in separate International Standards.

~~This standard distinguishes:~~

~~– between accuracy class index 1 and accuracy class index 2 meters;~~
~~– between protective class I and protective class II meters~~
~~– between meters for use in networks equipped with or without earth fault neutralizers.~~

The test levels are regarded as minimum values to guarantee the proper functioning of the meter under normal working conditions. For special application, other test levels might be necessary and will be fixed between the user and the manufacturer.

The static meter will face the same general environmental conditions as the electromechanical meter. Therefore, the specification will implement all the requirements fixed in IEC 521 wherever necessary, in particular the mechanical requirements.

Regarding accuracy requirements and the errors due to other influence quantities, it is expected that the electronic solutions will show a much better performance. The application of the same error limits as used in IEC 521 makes more economical and more reliable products possible and does not require new definitions for class 1 ~~and class 2~~ meters. In future revisions of this standard, the practical experience should be taken into account.

Regarding the influence of harmonics, special test procedures had to be incorporated. These tests check the functionality of the meter when the meter is exposed to large distortions in the current circuit and the accuracy of the meter with 5^{th} harmonic in the current and voltage circuit.

To check the functionality, three practical conditions have been specified:

– half-wave rectification (d.c. and even harmonics);
– phase-fired control (odd harmonics);
– burst control (sub-harmonics).

To check if the meters accurately measure total energy in the presence of harmonics a test with 5^{th} harmonic in both the current and voltage circuits has been specified. It is assumed that correct measurement of 5^{th} harmonic energy indicates that measurement for other harmonics will be good.

The reliability aspects of equipment for electrical energy measurement and load control will be handled separately.

For tests and test conditions, existing tests and test levels have been taken from IEC 521, IEC 687 and appropriate IEC specifications. New tests had to be added with respect to EMC.

The IEC publications referred to in this standard are listed in clause 2.

For Australian conditions, it has twice been found impracticable (in 1985 and 1990) to adopt IEC 60521 as an Australian Standard for induction meters, for reasons detailed in the Preface of AS 1284.1. Similar objections apply to the electronic meter Class 2. Accordingly, Class 1 limits from IEC 61036 have been adopted as suitable for present and future use.

An IEC 61036 indoor meter is considered insufficiently protected against environmental influences in a large proportion of Australian installations.

For CT-operated meters, this edition of IEC 61036/AS 1284.5 introduces the concept of rated current I_n (instead of I_b as for direct-connected meters), which concept was first introduced in IEC 60687 (AS 1284.9).

STANDARDS AUSTRALIA

Australian Standard

Electricity metering
Part 5: General purpose electronic watthour meters

Any IEC table, figure or passage of text that is struck through is not part of this Standard. Any Australian table, figure or passage of text that is added (and identified by shading) is part of this Standard.

1 Scope and application

This International Standard applies only to newly manufactured static watt-hour meters of accuracy ~~classes 1 and 2~~ class 1,for the measurement of alternating current electrical active energy of a frequency ~~in the range 45 Hz to 65 Hz~~ of 50 Hz and to their type tests only.

It applies only to static watt-hour meters for ~~indoor and outdoor~~ Australian outdoor application consisting of a measuring element and register(s) enclosed together in a meter case. It also applies to operation indicator(s) and test output(s).

It does not apply to:

a) watt-hour meters where the voltage across the connection terminals exceeds 600 V (line-to-line voltage for meters for polyphase systems);

b) portable meters;

~~c) data interfaces to the register of the meter.~~

Where the display and/or the memory(ies) is/are external or where other elements are enclosed in the meter case (such as maximum demand indicators, telemetering, time switches or remote control, etc.) this standard applies only to the metering section.

This standard does not cover the acceptance tests and the conformity tests (both testing procedures are connected with legal requirements of the different countries and could only be taken care of partially). Regarding acceptance tests, a basic guideline is given in IEC 514.

The reliability aspect is also not covered in this standard as there are no short-term test procedures available which would fit into type test documents to satisfactorily check this requirement.

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

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

