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Measurement of standby power for appliances and equipment

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Measurement of standby power for appliances and equipment

FOREWORD

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IEC 62301 has been prepared by IEC technical committee 59: Performance of household and similar electrical appliances. It is an International Standard.

This third edition cancels and replaces the second edition published in 2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) expansion of the scope in line with the approved horizontal application of this standard;

b) inclusion of battery powered and DC powered devices;

c) complete revision and expansion of the definitions (this has been done in conjunction with TC 100/TA19 JWG2 and the definitions in this document and IEC 63474:2026 for networked standby are fully aligned);

d) clarification that this document covers all non-active modes except for networked standby mode(s), which is covered by IEC 63474:2026;

e) reiteration that a wide range of product committees and their standards can reference this document and that they are free to define modes relevant for their products and to some extent measurement conditions that may be product specific, while using the broad methodology set out in this document;

f) more precise specification of room illuminance requirements has been added, where required;

g) mandatory requirements for data logging of test data;

h) requirement that no data loss or out of range records occur within the data set being used to assess product performance;

i) removal of the Average reading method and Direct meter reading method as valid measurement methods;

j) greater detail in set-up procedures;

k) revision of stability requirements, including the refinement of linear regression validity requirements and cyclic load validity requirements, and the introduction of a new alternative approach called the moving average method to ensure that results are as representative and accurate as possible;

l) further refinement of measurement uncertainty requirements for power measuring instruments, especially for more difficult loads with high crest factor and/or low power factor, so that these are more in line with changes in the performance of measuring instruments typically used in laboratories;

m) inclusion of explicit requirements in the assessment of large data sets against uncertainty requirements;

n) updated guidance on product configuration, instrumentation settings and calculation of measurement uncertainty;

o) inclusion of definitions for all relevant non-active modes and use of these new definitions and more rigorous terminology throughout the document.

The text of this International Standard is based on the following documents:

Draft	Report on voting
59/867/FDIS	59/870/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

It has the status of a group energy efficiency publication in accordance with IEC GUIDE 118 [1] .

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

The methods defined in this document are intended to cover non-active modes. They are not intended to be used to measure the power of products during active modes (also called "on mode(s)"), as these are generally covered by IEC or other product standards (see Bibliography for some examples), although the measuring techniques, measurement uncertainty determination and test equipment specifications could be adapted for such measurements with careful review.

1 Scope

This document specifies methods of measurement of electrical power in standby mode(s) and other non-active modes (such as off mode) and the reporting of the results.

The measurement of power and energy use in networked standby mode, is covered by IEC 63474:2026.

This document applies to electronic and electrical equipment powered by:

– low voltage AC power (LV ≤ 1 000 V AC), or
– low voltage DC power (LV ≤ 1 500 V DC) that is ripple-free, measured between conductors or between a conductor and earth, or
– extra low voltage AC power (ELV ≤ 50 V AC), or
– extra low voltage DC power (ELV ≤ 120 V DC) that is ripple-free, measured between conductors or between a conductor and earth, or
– an external power supply that provides low voltage or extra low voltage AC or DC power, or
– a separate source of extra low voltage DC power, or
– an internal main battery.

Conditions that are out of scope:

– active modes (primary function)
– networked standby mode (which is covered by IEC 63474:2026)
– conditions where main batteries are being charged other than in maintenance mode
– disconnected condition of the equipment.

This document applies to the following product groups where a non-active mode is present:

– household appliances, electrical and electronic equipment such as information technology equipment, audio, video and multimedia systems and equipment,
– gas burning equipment with electrical components.

NOTE 1 The measurement of power, energy use and performance of products during their intended use (when performing their primary functions) are generally specified in product standards and are not covered by this document.

Where this document is referenced by performance standards or procedures, these are to define and name the relevant non-active mode to which this test procedure is applied.

NOTE 2 Non-active modes for lighting equipment and the measurement of power is specified in IEC 63103 [2].

NOTE 3 Edge equipment can also include auxiliary batteries.

Annex A shows the conceptual framework of power modes and functions.

This document does not specify safety requirements. It does not specify minimum performance requirements nor does it set maximum limits on power or energy use.

This group energy efficiency publication is primarily intended to be used as an energy efficiency standard for the products mentioned in the scope, but is also intended to be used by TCs in the preparation of publications for products which are included in the boundary mentioned in the scope of this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 63474:2026, *Electrical and electronic household and office equipment - Measurement of networked standby power consumption of edge equipment*

3 Terms, definitions, abbreviated terms and symbols

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

– IEC Electropedia: available at https://www.electropedia.org/

– ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1 Function-related terms and definitions

3.1.1.1
function
<of a product> predetermined operation undertaken by a product

Note 1 to entry: Functions can be controlled by an interaction of the user, of other technical systems, and of the system itself, from measurable inputs from the environment and/or time.

Note 2 to entry: A function can be classified as primary function (3.1.1.2), secondary function (3.1.1.3) or tertiary function (3.1.1.4), which are broad categories. The specific categorisation of a function can be determined for each type of equipment.

3.1.1.2
primary function
<of a product> function (3.1.1.1) providing a main intended purpose

EXAMPLE Cleaning of clothes by a washing machine, displaying of video or providing sound by a television.

Note 1 to entry: Products can have more than one primary function.

Note 2 to entry: Figure A.1 provides a structured overview as an aid to understanding functional relationships and energy use applicable in electrotechnical products. Additional terms and definitions to fulfil the particular needs of product sectors should be defined within the structure of the concepts shown in Figure A.1.

[SOURCE: IEC 60050-904:2014 [3], 904-03-02, modified - ‘main’ added to the definition, Example and new ‘Note 1 to entry’ added, and Table 1 replaced by Figure A.1 in Note 2 to entry.]

3.1.1.3
secondary function
<of a product> function (3.1.1.1) that enables, supplements or enhances a primary function (3.1.1.2)

EXAMPLE 1 Secondary functions can include status information functions (3.1.1.5), network integrity functions (3.1.1.6), reactivation functions (3.1.1.7), or sensor-based functions (3.1.1.10).

EXAMPLE 2 Timer informing the remaining time for completion of the washing program or the delay start function (3.1.1.1) of a washing machine.