AS 61869.10:2021

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Instrument transformers

Part 10: Additional requirements for low-power passive current transformers (IEC 61869-10:2017 (ED 1.0) MOD)

AS 61869.10:2021

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Australian Industry Group
Energy Networks Australia
Engineers Australia
National Measurement Institute
University of South Australia

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Part 10: Additional requirements for low-power passive current transformers (IEC 61869-10:2017 (ED 1.0) MOD)

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Preface

This Standard was prepared by the Standards Australia Committee EL-013, Measurement and Protection Transformers.

The objective of this document is to specify additional requirements for low-power passive current transformers, used for measurement or protection, and multi-purpose low-power passive current transformers, used for both measurement and protection.

This document is applicable to newly manufactured low-power passive current transformers with analogue output for use with electrical measuring instruments, or electrical protective devices having a rated frequency from 15 Hz to 100 Hz.

This document is an adoption with national modifications, and has been reproduced from, IEC 61869-10:2017, *Instrument transformers — Part 10: Additional requirements for low-power passive current transformers.*

The modifications are additional requirements and are set out in Appendix ZZ, which has been added at the end of the source text.

Appendix ZZ lists the variation to IEC 61869-10:2017 for the application of this document in Australia.

As this document has been reproduced from an International Standard, the following applies:

(a) In the source text "this part of 61869" should read "this document".

(b) A full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms "normative" and "informative" are used in Standards to define the application of the appendices or annexes to which they apply. A "normative" appendix or annex is an integral part of a Standard, whereas an "informative" appendix or annex is only for information and guidance.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61869-10 has been prepared IEC technical committee 38: Instrument transformers.

This first edition of IEC 61869-10, together with IEC 61869-1, IEC 61869-6, IEC 61869-8 and IEC 61869-9, cancels and replaces the first edition of IEC 60044-8, published in 2002[1]. This edition constitutes a technical revision.

The technical changes concern IEC TC 38's decision to restructure the whole set of stand-alone standards in the IEC 60044 series and transform it into a new set of standards composed of general requirements documents and specific requirements documents.

[1] IEC 60044-8 will eventually be replaced by the IEC 61869 series, but until all the relevant parts of the IEC 61869 series will be published, this standard is still in force.

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

FDIS	Report on voting
38/550/FDIS	38/551/RVD

Full information on the voting for the approval of this part of IEC 61869 can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This standard is Part 10 of IEC 61869, published under the general title *Instrument transformers.*

This Part 10 is to be read in conjunction with, and is based on, IEC 61869-1:2007, *General requirements* and IEC 61869-6:2016, *Additional general requirements for low-power instrument transformers* – however, the reader is encouraged to use the most recent edition of these documents.

This Part 10 follows the structure of IEC 61869-1:2007 and IEC 61869-6:2016 and supplements or modifies the corresponding clauses.

When a particular subclause of Part 1or part 6 is not mentioned in this Part 10, that subclause applies. When this part of IEC 61869 states “addition”, “modification” or “replacement”, the relevant text in part 1 or part 6 is to be adapted accordingly.

For additional clauses, subclauses, figures, tables, annexes or note, the following numbering system is used:

– clauses, subclauses, tables, figures and notes that are numbered starting from 1001 are additional to those in Part 1 and Part 6;

– additional annexes are lettered 10A, 10B, etc.

An overview of the planned set of standards at the date of publication of this document is given below. The updated list of standards issued by IEC TC 38 is available on the IEC website.

PRODUCT FAMILY STANDARDS		PRODUCT STANDARD	PRODUCTS	OLD STANDARD
IEC 61869-1 GENERAL REQUIREMENTS		IEC 61869-2	ADDITIONAL REQUIREMENTS FOR CURRENT TRANSFORMERS	IEC 60044-1 IEC 60044-6
		IEC 61869-3	ADDITIONAL REQUIREMENTS FOR INDUCTIVE VOLTAGE TRANSFORMERS	IEC 60044-2
		IEC 61869-4	ADDITIONAL REQUIREMENTS FOR COMBINED TRANSFORMERS	IEC 60044-3
		IEC 61869-5	ADDITIONAL REQUIREMENTS FOR CAPACITIVE VOLTAGE TRANSFORMERS	IEC 60044-5
	IEC 61869-6 ADDITIONAL GENERAL REQUIREMENTS FOR LOW-POWER INSTRUMENT TRANSFORMERS	IEC 61869-7	ADDITIONAL REQUIREMENTS FOR ELECTRONIC VOLTAGE TRANSFORMERS	IEC 60044-7
		IEC 61869-8	SPECIFIC REQUIREMENTS FOR ELECTRONIC CURRENT TRANSFORMERS	IEC 60044-8
		IEC 61869-9	DIGITAL INTERFACE FOR INSTRUMENT TRANSFORMERS	
		IEC 61869-10	ADDITIONAL REQUIREMENTS FOR LOW-POWER PASSIVE CURRENT TRANSFORMERS	
		IEC 61869-11	ADDITIONAL REQUIREMENTS FOR LOW-POWER PASSIVE VOLTAGE TRANSFORMERS	IEC 60044-7
		IEC 61869-12	ADDITIONAL REQUIREMENTS FOR COMBINED ELECTRONIC INSTRUMENT TRANSFORMER OR COMBINED LOW-POWER PASSIVE INSTRUMENT TRANSFORMERS	
		IEC 61869-13	STAND-ALONE MERGING UNIT	
		IEC 61869-14	ADDITIONAL REQUIREMENTS FOR CURRENT TRANSFORMERS FOR DC APPLICATIONS	
		IEC 61869-15	ADDITIONAL REQUIREMENTS FOR VOLTAGE TRANSFORMERS FOR DC APPLICATIONS	

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Low-power passive current transformers (LPCT) are based on passive technologies without any active electronic components. They can have an output signal proportional to the primary current, for example iron core coils with integrated shunt as a current to voltage converter (primary converter) or they can have an output signal proportional to the derivative of the primary current, for example air-core coils (Rogowski coils). This part of IEC 61869 does not cover the air-core coils with active integrator.

According to a general block diagram given in Figure 601 of IEC 61869-6:2016, the low-power passive current transformers do not use an active primary converter (i.e. without any active electronic component); therefore, there is no need for primary power supply. Additionally, neither the secondary converter nor the secondary power supply is used.

The general block diagram of a low-power passive current transformer is given in Figure 1001.

The applied technology decides which part is necessary for the realization of a low-power passive current transformer, i.e. it is not absolutely necessary that the transmitting cable or primary converter described in Figure 1001 be included in the low-power passive current transformer. The derivative LPCT solution considers only the air-core coil as the primary sensor and the transmission cable as the transmitting system. In this technology, the primary converter is not considered. In case of a proportional LPCT solution, the ferromagnetic-core coil is considered as the primary sensor, a burden resistance connected directly to the coil outputs works as a primary converter and the transmission cable is a transmitting system.

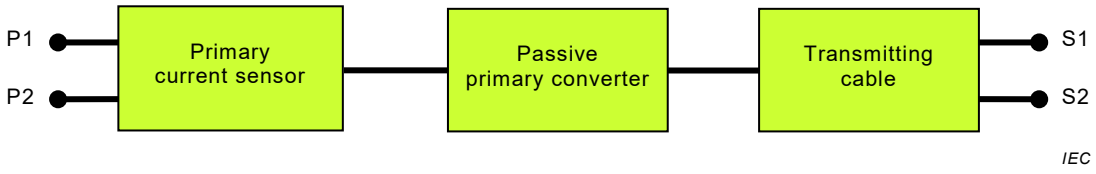

Figure 1001 – General block diagram of a single-phase low-power passive current transformer

INSTRUMENT TRANSFORMERS –

Part 10: Additional requirements for low-power passive current transformers

1 Scope

This part of IEC 61869 is a product standard and covers only additional requirements for low-power passive current transformers. The product standard for low-power passive current transformers comprises IEC 61869-1, together with IEC 61869-6 and this document with specific requirements.

This document is applicable to newly manufactured low-power passive current transformers with analogue output for use with electrical measuring instruments or electrical protective devices having a rated frequency from 15 Hz to 100 Hz.

This document covers low-power passive current transformers used for measurement or protection and multi-purpose low-power passive current transformers used for both measurement and protection.

Subclause 5.6.1001 covers the accuracy requirements that are necessary for low-power passive current transformers for use with electrical measuring instruments.

Subclause 5.6.1002 covers the accuracy requirements that are necessary for low-power passive current transformers for use with electrical protective relays, and particularly for forms of protection in which the prime requirement is to maintain the accuracy up to several times the rated current. If required, the transient accuracy of low-power passive current transformers during fault is also given in 5.6.1002.

Low-power passive current transformers have analogue voltage output only (for digital output or for technology using any kind of active electronic components refer to IEC 61869-8[2]). Such low-power passive current transformers can include the secondary signal cable (transmitting cable). The principle of operation of derivative low-power passive current transformers using air-core coils (Rogowski coils) is given in Annex 10B and the principle of operation of proportional low-power passive current transformers using iron-core coils with integrated shunt is given in Annex 10C.

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.

Clause 2 of IEC 61869-6:2016 is applicable with the following additions:

IEC 60059, *IEC standard current ratings*

IEC 61869-6:2016, I*nstrument transformers – Part 6: Additional general requirements for low-power instrument transformers*

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2 Under preparation.