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Instrumentni transformatorji - 1. del: Splošne zahteve

Instrument transformers - Part 1: General requirements

Messwandler - Teil 1: Allgemeine Anforderungen

Transformateurs de mesure - Partie 1: Exigences générales

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FUNCTIONS CONCERNED:

☒ EMC ☒ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	

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TITLE:

Instrument transformers - Part 1: General requirements

PROPOSED STABILITY DATE: 2027

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INSTRUMENT TRANSFORMERS

Part 1: General requirements

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 61869-1 has been prepared by IEC technical committee 38: Instrument transformers.

This second edition cancels and replaces the first edition published in 2007. This edition constitutes a technical revision.

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

The text of this standard is based on the following documents:

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for the approval of this standard 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.

A list of all parts in the IEC 61869 series, published under the general title *Instrument transformers*, can be found on the IEC website.

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 at the website: www.iec.ch

Product family standard	Product standard	Product
61869-1 General requirements	61869-2	Additional requirements for current transformers
	61869-3	Additional requirements for inductive voltage transformers
	61869-4	Additional requirements for combined transformers
	61869-5	Additional requirements for capacitive voltage transformers
	61869-7	Additional requirements for low-power voltage transformers
	61869-8	Additional requirements for low-power current transformers
	61869-9	Digital interface for instrument transformers
	61869-10	Current sensors
	61869-11	Voltage sensors
	61869-12	Additional requirements for combined low-power instrument transformers
	61869-13	Stand-alone merging unit
	61869-14	Additional requirements for current transformers for DC applications
	61869-15	Additional requirements for voltage transformers for DC applications
	61869-16	TEDS (Transducer Electronic Data Sheet) for instrument transformers
	61869-99	Glossary of terms

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.

The National Committees are requested to note that for this publication the stability date is 20XX.

this text is included for the information of the national committees and will be deleted at the publication stage.

INTRODUCTION

This document is the first revision of the standard IEC 61869-1, defining common requirements for instrument transformers, applicable to all types or technologies.

Furthermore, the document is the merge of the IEC 61869-1:2007 (General requirements) and the IEC 61869-6:2016 (Additional general requirements for low-power instrument transformers) with the aim to have one single document and simplify the comprehension for the reader of LPIT specific product standards.

The main modifications of this revision are listed below:

- New scope: equipment for HV applications with a nominal voltage > 1 kV AC or 1,5 kV DC;
- Transfer of the definitions to the TC38 Glossary IEC 61869-99;
- Ratings:
  - Addition of EHV insulation levels;
  - New DC insulation resistance requirements for secondary terminals;
  - Additional accuracy class extensions for harmonics;
- Design and construction
  - Additional mechanical requirements for EHV applications;
  - Clarification of the altitude correction for external insulation and dielectric tests;
  - Multiple chopped impulse test: definition of maximum gas-in-oil level before test;
  - Internal arc fault protection: simplification of the acceptance criteria;
  - New requirements for storage climatic conditions withstand capability for LPIT;
- Type tests
  - Temperature rise test: more accurate definition of the test duration;
  - Lightning impulse test: new test procedure (15 impulses) for gas-insulated and resin-insulated instrument transformers, for voltage level ≥ 300 kV;
  - Switching impulse test: to be performed in both polarities in case of gas-insulated instrument transformers;
  - Chopped wave impulse test: moved from special test to type test;
  - Test for accuracy: to be performed with regards to the temperature range and frequency;
  - Mechanical test: moved from special test to type test;
  - New specification for storage climatic environmental tests;
- Routine tests
  - Partial discharge measurement: addition of record of PD inception voltage and extinction voltage;
  - Measurement of capacitance and tanδ: moved from special test to routine test;
- Special tests
  - Transmitted overvoltage test: improved test procedure;
  - Internal arc fault test: clarified test procedure;
  - New insulation resistance measurement on secondary terminals;
  - New test for resin insulated instrument transformers operating at low temperature;
  - Vibration test: improvement and addition of a shock test for parts mechanically coupled to a circuit-breaker;
  - Optional tests for accuracy versus harmonics and low frequencies and for ant-aliasing;

- Commissioning tests (new clause)
  - New installation inspection;
  - Gas dew point test moved from special test to commissioning tests;
  - New recommended insulation test on LV connection up to the LV cubicle;
- Rules for transport, storage, erection, operation and maintenance:
  - New mandatory rules for user and manufacturer;
  - New conditions for transportation and storage;
- New Annexes
  - Annex F (informative): guidance for the extension of validity of type tests and special tests;
  - Annex J (normative): seismic qualification of instrument transformers.

INSTRUMENT TRANSFORMERS

Part 1: General requirements

1 Scope

This International Standard is applicable to newly manufactured instrument transformers intended for applications where the nominal voltage is higher than 1 kV AC or 1,5 kV DC, with analogue or digital secondary signal for measuring, protection and control purposes, with rated frequencies from 15 Hz to 400 Hz, or for DC applications.

NOTE 1 A bushing type current transformer, although having no primary insulation level for itself is often placed on a system with a nominal voltage > 1 kV AC or 1,5 kV DC and therefore falls within the scope of this document. Example: CT placed around a HV bushing or a cable.

The general requirements for instrument transformers for applications in LV systems (nominal voltage ≤ 1 kV AC or ≤ 1,5 kV DC) are covered by the standard IEC 61869-201.

This part of IEC 61869 is a product family standard and covers general requirements only. For each type of instrument transformer, the product standard is composed by this document and the relevant specific product standard.

This part of IEC 61869 defines the errors both for analogue and digital secondary signal. The other characteristics of a digital interface for instrument transformer are standardised in IEC 61869-9 as an application of the horizontal standard IEC 61850 series, covering communication networks and systems for power utility automation.

This part of IEC 61869 considers bandwidth requirements. The accuracy requirements on harmonics and requirements for the anti-aliasing filter are given in the sub-clause 5.7.

In case of LPIT, the general block diagram of single-phase devices is given in Figure 1.

According to the technology, it is not always necessary that all parts described in Figure 1 are included in the instrument transformer.

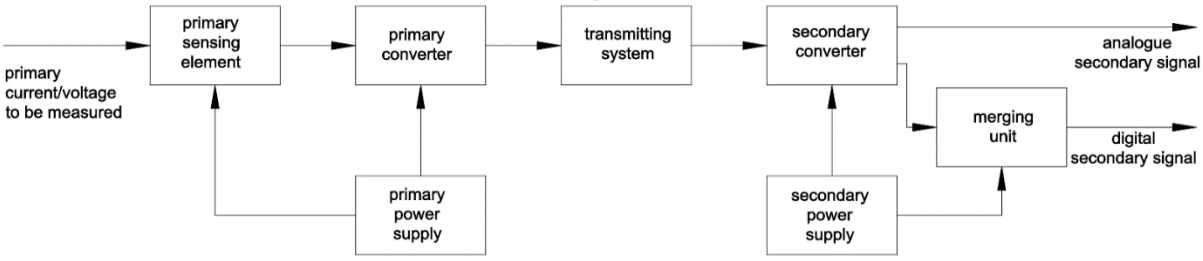

Figure 1 – General block diagram of single-phase LPIT

NOTE 2 A secondary power supply can be combined with a primary power supply or with a power supply of other instrument transformers.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50160:2010 + A2:2019, Voltage characteristics of electricity supplied by public distribution systems

IEC 60060-1:2010, High-voltage test techniques – Part 1: General definitions and test requirements