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Part 21: Uncertainty evaluation in the accuracy test of instrument transformers

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CONTENTS

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

Draft	Report on voting
38/829/FDIS	38/835/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 the rules given in the ISO/IEC Directives, Part 2, 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/.

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

The IEC Technical Committee and IEEE Technical Committee have 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,
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– revised.

INTRODUCTION

Accuracy is a crucial feature of instrument transformers (ITs) in most cases and applications: its assessment is required since a very long time by the relevant International Standards, which also establish the conventional accuracy requirements in terms of accuracy classes limits.

This document aims at a) providing information on the main sources of uncertainties arising in the setup used to test the accuracy of ITs and that must be taken into account in the evaluation of measurement uncertainty; b) defining the procedures to be implemented for testing the accuracy of ITs, depending on the type of IT (i.e. either with an analogue or a digital secondary signal) and assessing the conformity to the requirements reported in the product standards (conformity assessment); c) defining the procedure for evaluating the uncertainty contributions in testing the accuracy of ITs.

1 Scope

This part of IEC 61869 provides the requirements, the methods and the guidelines to be applied on the evaluation of uncertainty in testing the accuracy of instrument transformers (IT) with an analogue or a digital secondary signal for measuring, protection and control purposes, with rated frequencies from 15 Hz to 400 Hz.

This document covers the uncertainty evaluation in testing the accuracy of IT (including on-site testing of accuracy) independently of the technology used (either inductive or non-inductive).

This document reports on how to take into account the sources of uncertainty in the setups for accuracy and how to combine their effects in order to evaluate the uncertainty in the test results. Metrological traceability to the International System of Units (SI) will always be assumed for both reference devices and devices under test.

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 61869 (all parts), *Instrument transformers*

IEC 61869-9, *Instrument transformers - Part 9: Digital interface for instrument transformers*

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IEEE C57.13-2016, *IEEE Standard Requirements for Instrument Transformers*

JCGM 100:2008 or ISO/IEC Guide 98-3:2008, *Evaluation of measurement data - Guide to the expression of uncertainty in measurement (GUM)*

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IEC 60060-1:2025, *High-voltage test techniques - Part 1: General terminology and test requirements*

IEC 60060-2, *High-voltage test techniques - Part 2: Measuring systems*

IEC 60060-3, *High-voltage test techniques - Part 3: Definitions and requirements for on-site testing*

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