

INTERNATIONAL STANDARD

**Railway applications – Fixed installations – Particular requirements for AC
switchgear –
Part 3-2: Measurement, control and protection devices for specific use in AC
traction systems – Current transformers**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RAILWAY APPLICATIONS – FIXED INSTALLATIONS –
PARTICULAR REQUIREMENTS FOR AC SWITCHGEAR –****Part 3-2: Measurement, control and protection devices for
specific use in AC traction systems – Current transformers**

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 62505-3-2 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

This second edition cancels and replaces the first edition published in 2009. This edition constitutes a technical revision.

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

- this standard was revised to reflect the latest versions of standards referenced and to remove text already included in the IEC 61869 series.
- the structure of the document was adapted to that of IEC 62505-1 and IEC 62505-2.
- ratings have been added to provide designations in line with other railway standards, for example IEC 62497.

- test requirements have been detailed to meet operating conditions of railway applications.
- partial discharge voltages have been specified in Table 2.

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

FDIS	Report on voting
9/2564/FDIS	9/2576/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

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

This standard is to be read in conjunction with IEC 61869-1:2007 and IEC 61869-2:2012 (see Introduction).

A list of all parts in the IEC 62505 series, published under the general title *Railway applications – Fixed installations – Particular requirements for AC switchgear*, can be found on the IEC website.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or [IEC 62505-3-2:2020](https://standards.iteh.ai/catalog/standards/sist/4c5dfc60-0e3a-4cd6-8285-2e8847546058/iec-62505-3-2-2020)
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A bilingual version of this publication may be issued at a later date.

INTRODUCTION

Where a particular clause/subclause of IEC 61869-2 is not mentioned in this standard, that clause/subclause applies as far as reasonable. Where requirements relate exclusively to three-phase systems or to voltages outside those in use in traction systems, they are not applicable. Where this standard states “addition” or “replacement”, the relevant text of IEC 61869-2 is to be adapted accordingly.

The numbering of clauses in the IEC 61869 series is similar to that in the IEC 62505 series.

Where terms defined in IEC 61869-1 and IEC 61869-2 conflict with definitions of the same terms as given in IEC 60050-811:2017 or of the other railway applications documents listed in the normative references, the definitions in IEC 61869-1 and IEC 61869-2 are to be used.

NOTE The suffix N which appears in this document for rated values is not present in IEC 61869-1 and IEC 61869-2.

References in subclauses of IEC 61869-1 and IEC 61869-2 have to be replaced by references to applicable subclauses in this document as far as reasonably possible.

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RAILWAY APPLICATIONS – FIXED INSTALLATIONS – PARTICULAR REQUIREMENTS FOR AC SWITCHGEAR –

Part 3-2: Measurement, control and protection devices for specific use in AC traction systems – Current transformers

1 Scope

This part of IEC 62505 is applicable to new current transformers which are:

- intended for use in indoor or outdoor fixed installations in traction systems, and
- operated with an AC line voltage and frequency as specified in IEC 60850.

NOTE 1 IEC 60850 specifies the AC traction systems:

- 15 kV 16,7 Hz,
- 12 kV 25 Hz,
- 12,5 kV, 20 kV also 25 kV with 50 Hz and
- 12,5 kV, 20 kV, 25 kV also 50 kV with 60 Hz z.

NOTE 2 As rails of AC traction systems are typically connected to earth and included in the return current path, all phase to earth voltages are subject to the limits as given in IEC 60850. Nevertheless, conductor to conductor voltages are some times higher, e.g. in autotransformer systems.

This document does not provide specific requirements for AC traction systems supplied with a frequency of 25 Hz or with a nominal voltage of 12,5 kV or 50 kV. Nevertheless requirements set out in this document can also be used as a guidance for these systems.

This document also applies to low-voltage current transformers which are operated in a traction system with an AC line voltage and frequency as specified in IEC 60850.

NOTE 3 These are e.g. current transformers without primary conductor and primary insulation of their own, e.g. of the cable or ring core type.

Current transformers are mainly used with:

- measuring instruments,
- protective devices.

This document also applies to current transformers other than inductive types as far as reasonably possible. Requirements of this document have priority.

NOTE 4 Combined current and voltage transformers are typically not used in fixed installations in traction systems.

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 60850:2014, *Railway applications – Supply voltages of traction systems*

IEC 61869-1:2007, *Instrument transformers – Part 1: General requirements*

IEC 61869-2:2012, *Instrument transformers – Part 2: Additional requirements for current transformers*

IEC 62236-5:2018, *Railway applications – Electromagnetic compatibility – Part 5: Emission and immunity of fixed power supply installations and apparatus*

IEC 62497-1:2010, *Railway applications – Insulation coordination – Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment*
IEC 62497-1:2010/AMD1:2013

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61869-1:2007, except for 3.2.1 to 3.2.9 and IEC 61869-2:2012, and the following apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

NOTE Terms 3.2.1 to 3.2.3 of IEC 61869-1:2007 address voltage definitions which are differently defined in railway systems. Terms 3.2.4 to 3.2.9 of IEC 61869-1:2007 address aspects specific to three-phase systems.

3.1.1

nominal voltage

U_n

suitable approximate voltage value used to designate or identify a given supply system

Note 1 to entry: This value is also assigned to the ~~current transformer~~ to show its usability in the supply system.

Note 2 to entry: An autotransformer system which is supplied with 2 phases, having a phase shift of 180° between them, is commonly named $2 \times U_n$ according to the U_n supplied to the contact line system.

[SOURCE: IEC 62497-1:2010, 3.4.1, modified – The notes 1 and 2 to entry have been added.]

3.1.2

rated voltage

U_{Ne}

value of voltage assigned by the manufacturer to the equipment or part of it and to which operating and performance characteristics are referred

Note 1 to entry: This value is also used to determine its dielectric characteristics and will be used instead of the rated insulation voltage (U_{Nm}) as defined and used in IEC 62497 1:2010.

Note 2 to entry: The symbol U_r is not used for current transformers used in railway systems.

[SOURCE: IEC 62497-1:2010, 3.4.3, modified – Symbol added, wording of definition adapted and NOTE replaced by Note 1 to entry and Note 2 to entry.]

3.1.3

overvoltage category

OV

numeral defining a transient overvoltage condition

Note 1 to entry: This definition uses different wording as in other parts of the IEC 62505 series.

[SOURCE: IEC 60050-581:2008, 581-21-02, modified – The Note 1 to entry has been added.]