

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Railway applications – Fixed installations – Particular requirements for a.c. switchgear –

Part 3-2: Measurement, control and protection devices for specific use in a.c. traction systems – Single-phase current transformers

Applications ferroviaires – Installations fixes – Exigences particulières pour appareillage à courant alternatif –

Partie 3-2: Dispositifs de mesure, de commande et de protection pour usage spécifique dans les systèmes de traction à courant alternatif – Transformateurs de courant monophasés



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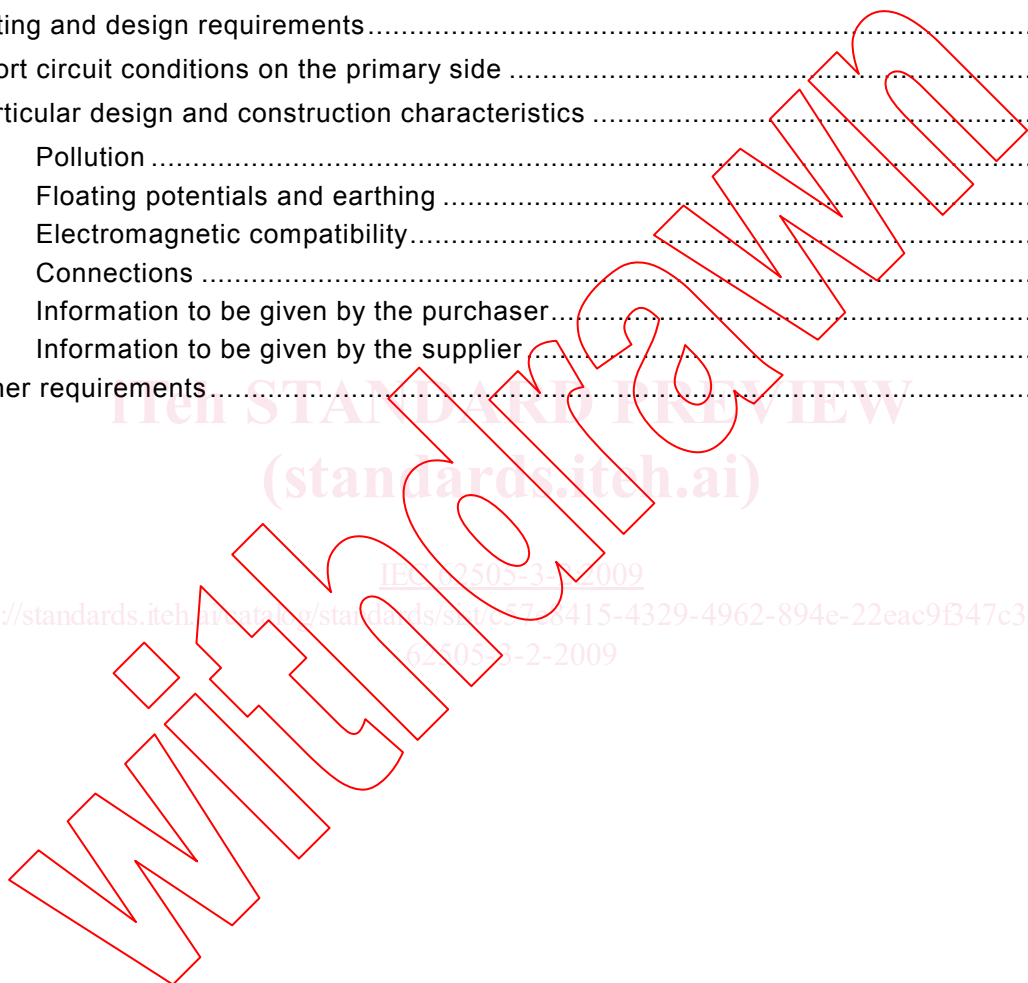
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

**Part 3-2: Measurement, control and protection devices
for specific use in a.c. traction systems –
Single-phase current transformers**

FOREWORD

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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 standard is based on EN 50152-3-2.

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

FDIS	Report on voting
9/1222/FDIS	9/1235/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 of IEC 62505 series, under the general title *Railway applications – Fixed installations – Particular requirements for a.c. switchgear*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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,
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INTRODUCTION

Part 3 of IEC 62505 series, "Railway applications – Fixed installations – Particular requirements for a.c. switchgear", concerning the measurement, control and protection devices for specific use in a.c. traction systems, comprises:

IEC 62505-3-1: Application guide (informative document)

IEC 62505-3-2: Single-phase current transformers (normative document)

IEC 62505-3-3: Single-phase inductive voltage transformers (normative document)

This International Standard applies when the equipment is concerned with the specified characteristics.

The requirements contained in this standard complement those given in IEC 60044-1:1996, Amendment 1 (2000), Amendment 2 (2002).

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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 a.c. traction systems – Single-phase current transformers

1 Scope

This part of IEC 62505 gives particular requirements for current transformers used in a.c. single-phase railway applications, fixed installations.

This International Standard applies to current transformers used at traction voltages and frequencies according to IEC 60850.

The main uses of these current transformers are:

- measurement;
- protection.

2 Normative references

The following referenced documents are indispensable for the application 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 60044-1:1996, *Instrument transformers – Part 1: Current transformers*
Amendment 1 (2000), Amendment 2 (2002)

IEC 60529:2001, *Degrees of protection provided by enclosures (IP Code)*

IEC 60850, *Railway applications – Supply voltages of traction systems*

IEC 62236 (all parts), *Railway applications – Electromagnetic compatibility*

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

IEC 62505 (all parts), *Railway applications – Fixed installations – Particular requirements for a.c. switchgear*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62505-1 and in IEC 60044-1 apply.

4 Service conditions

Where the equipment described in this part of the standard is mounted on circuit-breakers according to IEC 62505-1, then the service conditions of that standard apply. Where they are separately mounted and are used in association with switchgear then the same service conditions as the switchgear apply.

5 Characteristics and use

The current transformer shall be:

- a) either mounted inside the circuit-breaker specified in IEC 62505-1 and accommodated within special bushings on the circuit-breaker; technical requirements of this IEC 62505-3-2 apply together with the construction and test requirements (as applicable) of IEC 62505-1;
- b) or separately mounted free standing; technical requirements of this IEC 62505-3-2 apply.

6 Rating and design requirements

Clauses 4 and 5 of IEC 60044-1:1996 apply with the following exceptions:

- In Subclause 4.2 the words “but the preferred value is 5 A.” shall be replaced by “but the preferred values are 1 A or 5 A.”
- In Clause 5 the entire Subclause 5.1.1 shall be replaced by:

5.1.1 Rated insulation levels for the primary winding

Current transformers covered by this standard shall have the same insulation ratings and test values as the equipment into which they are installed. See Table 1 of IEC 62505-1 and IEC 62505-2. Free standing current transformers shall meet the same requirements.

- Subclause 5.1.6 of IEC 60044-1 is valid unless inconsistent with 8.1 of this Standard.

7 Short circuit conditions on the primary side

The following requirements, additional to those of IEC 60044-1:1996, apply:

Current transformers shall have a rated short time withstand current for a duration of 1 s, with a peak value of 2,5 p.u. in accordance with the requirements of IEC 60044-1:1996.

NOTE These events occur often and special attention should be paid to protect these current transformers.

The operating sequence of the associated circuit-breaker as defined in 5.17 of IEC 62505-1 shall be taken into account

8 Particular design and construction characteristics

The following requirements, additional to those of IEC 60044-1:1996, apply:

8.1 Pollution

The dust pollution on railway tracks (e.g. in tunnels and at the seaside) is often higher than on high voltage transmission lines. For this reason the creepage distance shall not be less than specified in IEC 62497-1, Table A.7, for the appropriate pollution degree.

NOTE For the choice of the appropriate pollution degree, the degree used in the associated switchgear (see IEC 62505-1 and IEC 62505-2) should be taken into account.

8.2 Floating potentials and earthing

No metallic part of the current transformer shall be left at floating potential. The earthing connection shall be able to carry the rated short time withstand current for a duration of 1 s.

8.3 Electromagnetic compatibility

The current transformer shall comply with IEC 62236 for electromagnetic compatibility.

8.4 Connections

The current transformer may be either connected on the primary side through its terminals or be of the toroidal type, with or without a primary conductor.

The connections shall withstand the mechanical stresses of the rated short time withstand current on the primary side.

If the current transformer has more than one ratio (multi-tapping current transformers) and the changeover of the ratio is made on the secondary side, the changeover shall be possible without de-energising the primary side.

The secondary connection box of outdoor current transformers shall have a minimum protection degree IP 54 in accordance with IEC 60529.

8.5 Information to be given by the purchaser

The purchaser shall provide the following information:

- location of the current transformer (e.g. on a pole or mast, in a cabinet, on the floor indoor or outdoor);
- type of primary connection (see 8.4);
- special material and form for connections, if necessary;
- rated value of the primary current;
- rated value of the secondary current;
- rated short time withstand current and duration of 1 s;
- rated value of the output;
- accuracy class of the current transformer;
- reclosing cycle on the network;
- indication of the insulation level (U_{Nm} , U_{Ni} , U_a - see IEC 62497-1 for definitions).

8.6 Information to be given by the supplier

The supplier shall provide the following information:

- variation of the actual transformation ratio of the current transformer as a function of the frequency in the range from rated frequency to 1 kHz (if required);
- response of the current transformer in transient conditions (if required);
- weight;
- dimensions;
- indication of the maximum static withstand test load to be applied in any direction to the primary terminals (if required).

9 Other requirements

The remaining Clauses of IEC 60044-1:1996 from 6 to 12 plus Annex A apply, unless they are inconsistent with the above requirements and with the character of single-phase current transformers used in a.c. traction systems.
