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Low-voltage surge protective devices -
Part 361: Surge isolation transformers (SITs) connected to low-voltage distribution system - Requirements and test methods

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IEC 61643-361 has been prepared by subcommittee 37B: Components for low-voltage surge protection, of IEC technical committee 37: Surge arresters. It is an International Standard.

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

Draft	Report on voting
37B/267/FDIS	37B/270/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 ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, 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 61643 series, published under the general title *Low-voltage surge protective devices*, 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,

– withdrawn, or

– revised.

INTRODUCTION

This part of IEC 61643 covers surge isolation transformers (SITs) whose rated impulse withstands voltage coordinates with the expected surge environment of the installation location. This type of surge protective component (SPC) isolates and attenuates transient voltage in conjunction with current diverting components (or SPDs).

SITs are a product with specific enhanced insulation layers between the primary and secondary windings and an electric screen (ES) inserted between primary and secondary windings. With these ES and specific enhanced insulation layers, the surge that appears between the primary winding and earth (common-mode) is greatly attenuated and appears between the secondary winding and earth. SITs are products with a particularly improved impulse withstand voltage compared to ordinary isolating transformers.

It is essential that SITs are protected by an appropriate SPD at their primary side, to avoid any damage to the SIT itself. SITs are intended to be used in surge protection to establish lightning protection zones.

1 Scope

This part of IEC 61643 applies to surge isolation transformers (SITs) dedicated to surge mitigation and for connection to 50/60 Hz power circuits and equipment rated up to 1 000 V RMS. This document covers the surge and mitigation performance of SITs with an impulse withstand voltage performance of at least 30 kV, and provides standard methods for testing and rating.

This document covers surge-related parameters but does not address typical transformer tests and parameters covered by the IEC 61558 series [13][1]. This document also does not cover SIT operation under differential mode lightning surge conditions.

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 60068-1, *Environmental testing - Part 1: General and guidance*

Bibliography

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

[2] IEC 61643-12, *Low-voltage surge protective devices - Part 12: Surge protective devices connected to low-voltage power systems - Selection and application principles*

[3] IEC 62305-4, *Protection against lightning - Part 4: Electrical and electronic systems within structures*

[4] ITU-T K.95, *Surge parameters of isolating transformers used in telecommunication devices and equipment*

[5] ITU-T K.126, *Surge protective component application guide - High frequency signal isolation transformers*

[6] IEEE PC62.69, *Standard for the surge parameter of isolating transformers used in networking devices and equipment*

[7] IEC TR 60664-2-1:2011, *Insulation coordination for equipment within low-voltage systems - Part 2-1: Application guide - Explanation of the application of the IEC 60664 series, dimensioning examples and dielectric testing*

[8] IEC 61643-351:2016, *Components for low-voltage surge protective devices - Part 351: Performance requirements and test methods for telecommunications and signalling network surge isolation transformers (SIT)*

[9] IEC 60050-151:2001, *International Electrotechnical Vocabulary (IEV) - Part 151: Electrical and magnetic devices*

[10] IEC 60664-1:2020, *Insulation coordination for equipment within low-voltage supply systems - Part 1: Principles, requirements and tests*

[11] IEC 60050-614:2016, *International Electrotechnical Vocabulary (IEV) - Part 614: Generation, transmission and distribution of electricity - Operation*

[12] IEC 60099-4:2014, *Surge arresters - Part 4: Metal-oxide surge arresters without gaps for a.c. systems*

[13] IEC 61558 (all parts), *Safety of transformers, reactors, power supply units and combinations thereof*

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