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English Version

Low-voltage surge protective devices - Part 22: Surge protective devices connected to telecommunications and signalling networks - Selection and application principles (IEC 61643-22:2015 , modified)

Parafoudres basse tension -
Partie 22: Parafoudres connectés aux réseaux de signaux et de télécommunications - Principes de choix et d'application
(IEC 61643-22:2015 , modifiée)

Überspannungsschutzgeräte für Niederspannung -
Teil 22: Überspannungsschutzgeräte für den Einsatz in Telekommunikations- und signalverarbeitenden Netzwerken - Auswahl und Anwendungsprinzipien
(IEC 61643-22:2015 , modifiziert)

This Technical Specification was approved by CENELEC on 2016-02-29.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

This document (CLC/TS 61643-22:2016) consists of the text of IEC 61643-22:2015 prepared by SC 37A "Low-voltage surge protective devices" of IEC/TC 37 "Surge arresters", together with the common modifications prepared by CLC/TC 37A "Low voltage surge protective devices".

This document supersedes CLC/TS 61643-22:2006.

CLCTS 61643-22:2016 includes the following significant technical changes with respect to CLC/TS 61643-22:2006:

a) Update the use of multiservice SPDs (Article 8)

b) Comparison between SPD classification of EN 61643-11 and EN 61643-21 (7.3.3)

c) Consideration of new transmission systems as PoE (Annex F)

d) EMC requirements of SPDs (Annex G)

e) Maintenance cycles of SPDs (Annex I)

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Endorsement notice

The text of the International Standard IEC 61643-22:2015 was approved by CENELEC as a European Standard with agreed common modifications.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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LOW-VOLTAGE SURGE PROTECTIVE DEVICES –

Part 22: Surge protective devices connected to telecommunications and signalling networks – Selection and application principles

FOREWORD

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International Standard IEC 61643-22 has been prepared by subcommittee 37A: Low-voltage surge protective devices, of IEC technical committee 37: Surge arresters.

This second edition cancels and replaces the first edition published in 2004. This edition constitutes a technical revision.

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

a) Update the use of multiservice SPDs (Article 8)

b) Comparison between SPD classification of IEC 61643-11 and IEC 61643-21 (7.3.3)

c) Consideration of new transmission systems as PoE (Annex F)

d) EMC requirements of SPDs (Annex G)

e) Maintenance cycles of SPDs (Annex I)

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

FDIS	Report on voting
37A/273/FDIS	37A/277/RVD

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

A list of all parts in the IEC 61643 series, published under the general title *Low-voltage surge protector devices*, can be found on the IEC website.

The committee has decided that the contents of this amendment and the base 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This International Standard is a guide for the application of SPDs to telecommunications and signalling lines and those SPDs which have telecom or signalling SPDs in the same enclosure with power line SPDs (so called multiservice SPDs). Definitions, requirements and test methods are given in IEC 61643-21. The decision to use SPDs is based on an analysis of the risks that are seen by the network or system under consideration. Because telecommunications and signalling systems may depend on long lengths of wire, either buried or aerial, the exposure to overvoltages from lightning, power line faults and power line/load switching, can be significant. If these lines are unprotected, the resultant risk to information technology equipment (ITE) can also be significant. Other factors that may influence the decision to use SPDs are local regulators and insurance stipulations. This standard provides indications for evaluating the need for SPDs, the selection, installation and dimensioning of SPDs and for achieving coordination between SPDs and between SPDs and ITE installed on telecommunication and signal lines.

Coordination of SPDs assures that a proper interaction between them, as well as between an SPD and the ITE to be protected will be realized. Coordination requires that the voltage protection level, U_p, and let-through current, I_p, of the initial SPD does not exceed the resistibility of subsequent SPDs or the ITE.

In general, the SPD closest to the source of the impinging surge diverts most of the surge: a downstream SPD will divert the remaining or residual surge. The coordination of SPDs in a system is affected by the operation of the SPDs and the equipment to be protected as well as the characteristics of the system to which the SPDs are connected.

The following variables should be reviewed when attempting to attain proper coordination:

- waveshape of the impinging surge (impulse or AC);
- ability of the equipment to withstand an overvoltage/overcurrent without damage;
- installation, e.g. distance between SPDs and between SPDs and ITE;
- SPD voltage-protection levels.

The performance of an SPD and its coordination with other SPDs can be affected by exposure to previous transients. This is especially true for transients which approach the limit of the capacity of the SPD. If there is considerable doubt concerning the number and severity of the surges handled by the SPDs under consideration, it is suggested that SPDs with higher capabilities be used.

One of the direct effects of poor coordination may be bypassing of the SPD closest to the surge source, with the result that the following SPD will be forced to handle the entire surge. This can result in damage to that SPD.

Lack of proper coordination can also lead to equipment damage and, in severe cases, may lead to a fire hazard.

There are several technologies used in the design of the SPDs covered in this standard. These are explained in the main text and also in informative Annexes A and B.

LOW-VOLTAGE SURGE PROTECTIVE DEVICES –

Part 22: Surge protective devices connected to telecommunications and signalling networks – Selection and application principles

1 Scope

This part of IEC 61643 describes the principles for the selection, operation, location and coordination of SPDs connected to telecommunication and signalling networks with nominal system voltages up to 1 000 V r.m.s. a.c. and 1 500 V d.c.

This standard also addresses SPDs that incorporate protection for signalling lines and power lines in the same enclosure (so called multiservice SPDs).

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 61643-21:2001 + A1:2009 +A2:2013, *Low voltage surge protective devices – Part 21: Surge protective devices connected to telecommunications and signalling networks – Performance requirements and testing methods* (IEC 61643-21:2000 + A1:2008, modified +A2:2012)

EN 61643-11, *Low-voltage surge protective devices – Part 11: Surge protective devices connected to low-voltage power systems – Requirements and test methods* (IEC 61643-11)

EN 61643-12, *Low-voltage surge protective devices – Part 12: Surge protective devices connected to low-voltage power distribution systems – Selection and application principles* (IEC 61643-12)

EN 62305-1:2011, *Protection against lightning – Part 1: General principles* (IEC 62305-1:2010, modified)

EN 62305-2:2012, *Protection against lightning – Part 2: Risk management* (IEC 62305-2:2010, modified)

EN 62305-3:2011 *Protection against lightning – Part 3: Physical damage to structures and life hazard* (IEC 62305-3:2010, modified)

EN 62305-4:2011 *Protection against lightning – Part 4: Electrical and electronic systems within structures* (IEC 62305-4:2010, modified)

EN 61000-4-5, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test* (IEC 61000-4-5)

3 Terms, definitions and abbreviations

For the purposes of this document, the following terms, definitions and abbreviations apply.