



**NSAI**  
Standards

Irish Standard  
I.S. EN 61643-21:2001

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 (EQV) + corrigendum  
Mar. 2001 (EQV))

## I.S. EN 61643-21:2001

*Incorporating amendments/corrigenda issued since publication:*

EN 61643-21:2001/A1:2009  
EN 61643-21:2001/A2:2013

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I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

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**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/A2:2012)**

Parafoudres basse-tension -  
Partie 21: Parafoudres connectés  
aux réseaux de signaux  
et de télécommunications -  
Prescriptions de fonctionnement  
et méthodes d'essais  
(CEI 61643-21:2000/A2:2012)

Überspannungsschutzgeräte  
für Niederspannung -  
Teil 21: Überspannungsschutzgeräte für  
den Einsatz in Telekommunikations- und  
signalverarbeitenden Netzwerken -  
Leistungsanforderungen  
und Prüfverfahren  
(IEC 61643-21:2000/A2:2012)

This amendment A2 modifies the European Standard EN 61643-21:2001; it was approved by CENELEC on 2012-08-31. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 37A/236/FDIS, future amendment 2 to edition 1 of IEC 61643-21, prepared by IEC/SC 37A "Low-voltage surge protective devices" of IEC/TC 37 "Surge arresters" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61643-21:2001/A2:2013.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-07-25
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-08-31

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

## Endorsement notice

The text of the International Standard IEC 61643-21:2000/A2:2012 was approved by CENELEC as a European Standard without any modification.

In the Bibliography of EN 61643-21:2001, the following note has to be **added** for the standard indicated:

IEC 60664-1      NOTE      Harmonised as EN 60664-1.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
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*In Annex ZA of EN 61643-21:2001, **replace** IEC 60999-1:1999 by IEC 60999-1:*

IEC 60999-1	-	Connecting devices - Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units - Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm <sup>2</sup> up to 35 mm <sup>2</sup> (included)	EN 60999-1	-
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*In Annex ZA of EN 61643-21:2001, **replace** ITU-T Recommendation K.30:1993 by ITU-T Recommendation K.82:*

ITU-T Recommendation K.82	-	Characteristics and ratings of solid-state, self-restoring overcurrent protectors for the protection of telecommunications installations	-	-
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**Add to Annex ZA of EN 61643-21:2001 the following new references:**

IEC 61643-11 (mod)	2011	Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods	EN 61643-11	2012
ITU-T Recommendation K.44	2011	Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents - Basic Recommendation	-	-

*In Annex ZA of EN 61643-21:2001/A1:2009, **delete** ITU-T Recommendation K.65*

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EUROPEAN STANDARD

**EN 61643-21/A1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2009

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English version

**Low voltage surge protective devices -  
Part 21: Surge protective devices connected to telecommunications  
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Performance requirements and testing methods  
(IEC 61643-21:2000/A1:2008, modified)**

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und signalverarbeitenden Netzwerken -  
Leistungsanforderungen  
und Prüfverfahren  
(IEC 61643-21:2000/A1:2008, modifiziert)

This amendment A1 modifies the European Standard EN 61643-21:2001; it was approved by CENELEC on 2009-03-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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**CENELEC**

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

**Central Secretariat: avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of amendment 1:2008 to the International Standard IEC 61643-21:2000, prepared by SC 37A, Low-voltage surge protective devices, of IEC TC 37, Surge arresters, together with common modifications prepared by the Technical Committee CENELEC TC 37A, Low voltage surge protective devices, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as amendment A1 to EN 61643-21:2001 on 2009-03-01.

In this document the common modifications to IEC 61643-21:2000/A1:2008 are indicated by a vertical line in the left margin of the text.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2010-03-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2012-03-01

Annex ZA, which was added by CENELEC, has been updated to reflect the changes in the normative references.

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EUROPEAN STANDARD

**EN 61643-21**

NORME EUROPÉENNE

EUROPÄISCHE NORM

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**Low voltage surge protective devices  
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(IEC 61643-21:2000 + Corrigendum 2001)

This European Standard was approved by CENELEC on 2000-11-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

**I.S. EN 61643-21:2001**

EN 61643-21:2001

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**Foreword**

The text of document 37A/101/FDIS, future edition 1 of IEC 61643-21, prepared by SC 37A, Low-voltage surge protective devices, of IEC TC 37, Surge arresters, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61643-21 on 2000-11-01.

The following dates were fixed:

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at national level by publication of an identical  
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- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2003-11-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes C and ZA are normative and annexes A and B are informative.

Annex ZA has been added by CENELEC.

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**Endorsement notice**

The text of the International Standard IEC 61643-21:2000 + corrigendum March 2001 was approved by CENELEC as a European Standard without any modification.

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## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-702	1992	International electrotechnical vocabulary Chapter 702: Oscillations, signals and related devices	-	-
IEC 60050-726	1982	Chapter 726: Transmission lines and waveguides	-	-
IEC 60060-1 + corr. March	1989 1990	High-voltage test techniques Part 1: General definitions and test requirements	HD 588.1 S1	1991
IEC 60068-2-30	1980	Environmental testing Part 2: Tests - Test Db and guidance: Damp heat, cyclic (12 + 12 hour cycle)	EN 60068-2-30 <sup>1)</sup>	1999
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
IEC 60695-2-1/1	1994	Fire hazard testing Part 2: Test methods Section 1/sheet 1: Glow-wire end- product test and guidance	EN 60695-2-1/1 <sup>2)</sup>	1996
IEC 60950 (mod) + corr. January	1999 2000	Safety of information technology equipment	EN 60950	2000
IEC 60999-1	1999	Connecting devices - Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm <sup>2</sup> up to 35 mm <sup>2</sup> (included)	EN 60999-1	2000

1) EN 60068-2-30 includes A1:1985 to IEC 60068-2-30.

2) EN 60695-2-1/1 is superseded by EN 60695-2-11:2001, which is based on IEC 60695-2-11:2000.

**I.S. EN 61643-21:2001**

EN 61643-21:2001

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<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-4-5	1995	Electromagnetic compatibility (EMC) Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	1995
IEC 61083-1 (mod)	1991	Digital recorders for measurements in high-voltage impulse tests Part 1: Requirements for digital recorders	EN 61083-1	1993
IEC 61180-1	1992	High-voltage test techniques for low- voltage equipment Part 1: Definitions, test and procedure requirements	EN 61180-1	1994
IEC 61643-1	1998	Surge protective devices connected to low-voltage power systems Part 1: Requirements and tests	-	-
ITU-T Recommendation K.17	1988	Tests on power-fed repeaters using solid-state devices in order to check the arrangements for protection from external interference	-	-
ITU-T Recommendation K.30	1993	Positive temperature coefficient (PTC) thermistors	-	-

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### LOW VOLTAGE SURGE PROTECTIVE DEVICES –

#### **Part 21: Surge protective devices connected to telecommunications and signalling networks – Performance requirements and testing methods**

### 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 61643-21 has been prepared by subcommittee 37A: Low-voltage surge protective devices, of IEC technical committee 37: Surge arresters.

This consolidated version of IEC 61643-21 consists of the first edition (2000) [documents 37A/101/FDIS and 37A/104/RVD], its amendment 1 (2008) [documents 37A/200/FDIS and 37A/201/RVD], its amendment 2 (2012) [documents 37A/236/FDIS and 37A/237/RVD] and its corrigendum of March 2001.

The technical content is therefore identical to the base edition and its amendments and has been prepared for user convenience.

It bears the edition number 1.2.



A vertical line in the margin shows where the base publication has been modified by amendments 1 and 2.

The committee has decided that the contents of the base publication and its amendments 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.

## INTRODUCTION

The purpose of this International Standard is to identify the requirements for Surge Protective Devices (SPDs) used in protecting telecommunication and signalling systems, for example, low-voltage data, voice, and alarm circuits. All of these systems may be exposed to the effects of lightning and power line faults, either through direct contact or induction. These effects may subject the system to overvoltages or overcurrents or both, whose levels are sufficiently high to harm the system. SPDs are intended to provide protection against overvoltages and overcurrents caused by lightning and power line faults. This standard describes tests and requirements which establish methods for testing SPDs and determining their performance.

The SPDs addressed in this International Standard may contain overvoltage protection components only, or a combination of overvoltage and overcurrent protection components. Protection devices containing overcurrent protection components only are not within the coverage of this standard. However, devices with only overcurrent protection components are covered in annex A.

An SPD may comprise several overvoltage and overcurrent protection components. All SPDs are tested on a "black box" basis, i.e., the number of terminals of the SPD determines the testing procedure, not the number of components in the SPD. The SPD configurations are described in 1.2. In the case of multiple line SPDs, each line may be tested independently of the others, but there may also be a need to test all lines simultaneously.

This standard covers a wide range of testing conditions and requirements; the use of some of these is at the discretion of the user. How the requirements of this standard relate to the different types of SPD is described in 1.3. Whilst this is a performance standard and certain capabilities are demanded of the SPDs, failure rates and their interpretation are left to the user. Selection and application principles are covered in IEC 61643-22.

If the SPD is known to be a single component device, it has to meet the requirements of the relevant standard as well as those in this standard.

## **LOW VOLTAGE SURGE PROTECTIVE DEVICES –**

### **Part 21: Surge protective devices connected to telecommunications and signalling networks – Performance requirements and testing methods**

#### **1 General**

##### **1.1 Scope**

This International Standard is applicable to devices for surge protection of telecommunications and signalling networks against indirect and direct effects of lightning or other transient overvoltages.

The purpose of these SPDs is to protect modern electronic equipment connected to telecommunications and signalling networks with nominal system voltages up to 1 000 V (r.m.s.) a.c. and 1 500 V d.c.

##### **1.2 SPD configurations**

The SPD configurations described in this standard are shown in figure 1. Each SPD configuration is composed of one or more voltage-limiting components and may include current-limiting components.

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