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Naprave priključene na telekomunikacijska in signalna omrežja- Zahtevane
lastnosti in preskusne metode (IEC 61643-21:2000 + popravek mar. 2001)**

Low voltage surge protective devices - Part 21: Surge protective devices connected
to telecommunications and signalling networks - Performance requirements and
testing methods

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EUROPEAN STANDARD

EN 61643-21

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2001

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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 + corrigendum 2001)**

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 + corrigendum 2001)

Überspannungsschutzgeräte für
Niederspannung
Teil 21: Überspannungsschutzgeräte für
den Einsatz in Telekommunikations- und
signalverarbeitenden Netzwerken -
Leistungsanforderungen und
Prüfverfahren
(IEC 61643-21:2000 + Corrigendum 2001)

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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

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:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2002-02-01
- 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.

Endorsement notice

iTeh STANDARD PREVIEW

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 ¹⁾	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 ²⁾	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 ² up to 35 mm ² (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.

<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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NORME
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STANDARD

CEI
IEC

61643-21

Première édition
First edition
2000-09

Parafoudres basse tension –

Partie 21:

Parafoudres connectés aux réseaux de signaux
et de télécommunications –

Prescriptions de fonctionnement
et méthodes d'essais

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Low voltage surge protective devices –

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Part 21:

Surge protective devices connected to
telecommunications and signalling networks –
Performance requirements
and testing methods

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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For price, see current catalogue*

CONTENTS

	Page
FOREWORD	9
INTRODUCTION	11
Clause	
1 General.....	13
1.1 Scope	13
1.2 SPD configurations	13
1.3 Use of this standard.....	17
2 Normative references.....	19
3 Definitions.....	21
4 Service and test conditions	29
4.1 Service conditions.....	29
4.1.1 Normal service conditions	29
4.1.2 Abnormal service conditions	29
4.2 Test temperature and humidity.....	29
4.3 SPD testing	31
4.4 Waveform tolerances.....	31
5 Requirements	33
5.1 General requirements.....	33
5.1.1 Identification and documentation.....	33
5.1.2 Marking.....	33
5.2 Electrical requirements.....	33
5.2.1 Voltage-limiting requirements.....	33
5.2.2 Current-limiting requirements	35
5.2.3 Transmission requirements	39
5.3 Mechanical requirements	39
5.3.1 Terminals and connectors	41
5.3.2 Mechanical strength (mounting)	43
5.3.3 Resistance to ingress of solid objects and to harmful ingress of water	43
5.3.4 Protection against direct contact	43
5.3.5 Fire resistance	43
5.4 Environmental requirements	43
5.4.1 High temperature and humidity endurance	43
5.4.2 Environmental cycling with impulse surges.....	45
5.4.3 Environmental cycling with a.c. surges.....	45
6 Type test.....	45
6.1 General tests	45
6.1.1 Identification and documentation.....	45
6.1.2 Marking.....	45
6.2 Electrical tests	47
6.2.1 Voltage-limiting tests.....	47
6.2.2 Current-limiting tests.....	57
6.2.3 Transmission tests.....	63

Clause	Page
6.3 Mechanical tests.....	67
6.3.1 Terminals and connectors	67
6.3.2 Mechanical strength (mounting)	71
6.3.3 Resistance to ingress of solid objects and to harmful ingress of water	71
6.3.4 Protection against direct contact	71
6.3.5 Fire resistance	73
6.4 Environmental tests	75
6.4.1 High temperature and humidity endurance	75
6.4.2 Environmental cycling with impulse surges.....	75
6.4.3 Environmental cycling with a.c. surges.....	77
6.5 Acceptance tests	77
Annex A (informative) Devices with current-limiting components only	105
Annex B (informative) Selection of applicable transmission tests.....	107
Annex C (normative) Test sequence	109
Bibliography	111
Figure 1 – SPD configurations	15
Figure 2 – Test circuits for impulse reset time	79
Figure 3 – Test circuits for a.c. durability and overstressed fault mode	81
Figure 4 – Test circuits for impulse durability and overstressed fault mode	83
Figure 5 – Test circuits for rated current, series resistance, response time, current reset time, maximum interrupting voltage and operating duty test.....	85
Figure 6 – Test circuits for a.c. durability	87
Figure 7 – Test circuits for impulse durability.....	89
Figure 8 – Test circuits for insertion loss	91
Figure 9 – Test circuit for return loss	91
Figure 10 – Test circuits for longitudinal balance	93
Figure 11 – Test circuit for bit error ratio test.....	95
Figure 12 – Test circuit for near-end crosstalk.....	97
Figure 13 – Test circuits for high temperature/humidity endurance and environmental cycling.....	99
Figure 14 – Environmental cycling schedule A with RH ≥ 90 %	101
Figure 15 – Environmental cycling B	103
Figure A.1 – Configurations of devices with current-limiting component(s) only	105

	Page
Table 1 – General SPD requirements	19
Table 2 – Waveform tolerances	31
Table 3 – Voltage and current waveforms for impulse-limiting voltage	49
Table 4 – Source voltages and currents for impulse reset test	51
Table 5 – Preferred values of currents for a.c. durability test	53
Table 6 – Test currents for response time	57
Table 7 – Preferred values of current for operating duty tests	61
Table 8 – Preferred values of a.c. test currents	61
Table 9 – Preferred values of impulse current	63
Table 10 – Standard parameters for figure 8	63
Table 11 – Impedance values for longitudinal balance test	65
Table 12 – Test times for BER test	67
Table 13 – Connectable cross-sectional areas of copper conductors for screw-type terminals or screwless-type terminals	69
Table 14 – Pulling force (screwless terminals)	69
Table 15 – Preferred values of test-time duration for high temperature and humidity endurance	75
Table 16 – Preferred values of temperature and duration for environmental cycling tests	77
Table B.1 – Applicable SPD tests for several transmission systems	107
Table C.1 – Testing sequence for table 1	109

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW VOLTAGE SURGE PROTECTIVE DEVICES –

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

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
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- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

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

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

FDIS	Report on voting
37A/101/FDIS	37A/104/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 3.

Annexes A and B are for information only.

Annex C forms an integral part of this standard.

The contents of the corrigendum of March 2001 have been included in this copy.

The committee has decided that the contents of this publication will remain unchanged until 2002-07. 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 will be covered in IEC 61643-22¹⁾.

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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.

1) Under consideration.

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.

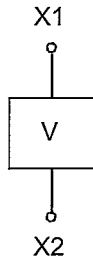
The purpose of these SPDs is to protect modern electronic equipment connected to telecommunications and signalling networks with nominal system voltages up to 1 000 V (r.m.s.) a.c. and 1 500 V d.c.

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. (standards.iteh.ai)

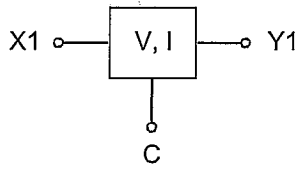
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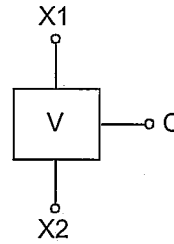
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Figure 1a – Two-terminal SPD



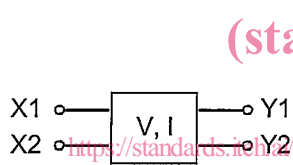
IEC 1298/2000

Figure 1b – Three-terminal SPD



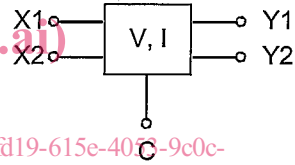
IEC 1299/2000

Figure 1c – Three-terminal SPD



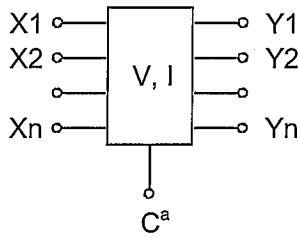
IEC 1300/2000

Figure 1d – Four-terminal SPD



IEC 1301/2000

Figure 1e – Five-terminal SPD



IEC 1302/2000

Figure 1f – Multi-terminal SPD

^a The common terminal C may not be provided

Key

- V voltage-limiting component
- V, I voltage-limiting components or a combination of voltage-limiting and current-limiting components
- X1, X2...Xn line terminals
- Y1, Y2...Yn protected line terminals
- C common terminal

Figure 1 – SPD configurations

1.3 Use of this standard

This standard considers two basic types of SPD.

The first type of SPD contains at least one voltage-limiting component and no current-limiting component(s) in a housing. All the SPD configurations of figure 1 can be of this type. These SPDs shall satisfy the requirements of 5.1, 5.2.1 and 5.3 (see table 1). The SPDs shown in figures 1b, 1d, 1e and 1f may contain a linear component between the line terminal and the corresponding protected line terminal. These SPDs shall also satisfy the applicable requirements of 5.2.2.

The second type of SPD contains both voltage-limiting and current-limiting components in a housing. SPD configurations shown in figures 1b, 1d, 1e, and 1f are applicable for SPDs with both voltage-limiting and current-limiting components. This type of SPD shall satisfy the requirements of 5.1, 5.2.1, 5.2.2 and 5.3 (see table 1). Configurations of protective devices having only current-limiting components are covered in annex A.

SPDs may need to satisfy additional requirements depending on the application. The additional requirements are described in 5.2.3 and 5.4 (see table 1).

Subclause 5.2.3 provides transmission tests that SPDs may need to conform to, depending on their communication and signalling application. Selection of the applicable transmission tests from 5.2.3 shall be made, based on the intended application of the SPDs. Annex B provides general guidance on how to select the applicable transmission tests.

Subclause 5.4 provides the environmental requirements when the SPDs are intended only for use in uncontrolled environments as described in 4.1. SPDs shall satisfy these requirements after an agreement between the user and the manufacturer. Table 1 provides examples of what requirements different types of SPD shall satisfy.

Annex C gives the test sequence and the number of samples to be tested.