



SLOVENSKI STANDARD
SIST EN 61643-21:2002/A1:2009
01-oktober-2009

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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

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Überspannungsschutzgeräte für Niederspannung -- Teil 21: Überspannungsschutzgeräte für den Einsatz in Telekommunikations- und signalverarbeitenden Netzwerken - Leistungsanforderungen und Prüfverfahren

[SIST EN 61643-21:2002/A1:2009](https://standards.iteh.ai/catalog/standards/sist/4ebd0f7e-cf8a-4cff-b8fa-2009-01-sist-en-61643-21:2002/a1:2009)

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Parafoudres basse-tension -- Partie 21: Parafoudres connectés aux réseaux de signaux et de télécommunications - Prescriptions de fonctionnement et méthodes d'essais

Ta slovenski standard je istoveten z: EN 61643-21:2001/A1:2009

ICS:

29.120.50	Xæ[çæ\ ^/æ /æi` * æ { ^åq \ [ç} æÁ æz ææ	Fuses and other overcurrent protection devices
29.240.10	Transformatorske postaje. Prenapetostni odvodniki	Substations. Surge arresters

SIST EN 61643-21:2002/A1:2009 en,fr

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61643-21/A1

April 2009

ICS 29.240; 29.240.10

English version

**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)**

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/A1:2008, modifié)

Überspannungsschutzgeräte
für Niederspannung -
Teil 21: Überspannungsschutzgeräte
für den Einsatz in Telekommunikations-
und signalverarbeitenden Netzwerken -
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(IEC 61643-21:2000/A1:2008, modifiziert)

[SIST EN 61643-21:2002/A1:2009](https://standards.iteh.ai/catalog/standards/sist/4ebd0f7e-cf8a-4cff-b8fa-2dde342442c1/sist-en-61643-21-2002-a1-2009)

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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.

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 amendment 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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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<https://standards.iteh.ai/catalog/standards/sist/4ebd0f7e-cf8a-4cff-b8fa-2dde342442c1/sist-en-61643-21-2002-a1-2009>

Foreword

Delete the references to the annexes.

1.2 SPD configurations

Replace Figures 1a to 1f with:

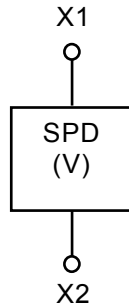


Figure 1a – Two-terminal SPD



Figure 1b – Three-terminal SPD

Figure 1c – Three-terminal SPD

<https://standards.iteh.ai/catalog/standards/sist/4ebd0f7e-cf8a-4cff-b8fa-2dde342442c1/sist-en-61643-21-2002-a1-2009>

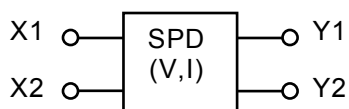


Figure 1d – Four-terminal SPD

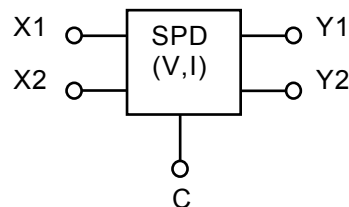
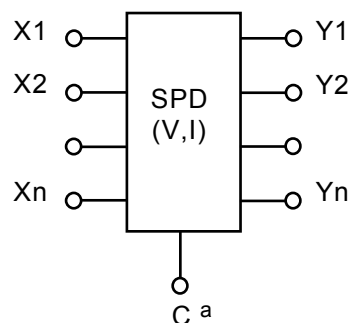


Figure 1e – Five-terminal SPD



^a The common terminal C may not be provided.

Figure 1f – Multi-terminal SPD

1.3 Use of this standard

Replace the 5th paragraph with:

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. Table 1 provides general guidance on how to select the applicable transmission tests.

Delete the last paragraph.

Replace Table 1 with:

Table 1 – General SPD requirements

Test series ⁴	Requirement – Test	Sub-clause	Type of SPD					
			SPD with only voltage-limiting function	SPD with both voltage-limiting and current-limiting functions	SPD with voltage-limiting function and linear component between its terminals	SPD having both voltage-limiting and current-limiting functions with enhanced transmission capabilities	SPD having only voltage-limiting function but intended for use in extended range environment	SPD having both voltage-limiting and current-limiting functions but intended for use in extended range environment
1	General test	6.1						
	Identification and documentation	6.1.1	A	A	A	A	A	A
	Marking	6.1.2	A	A	A	A	A	A
	Transmission tests	6.2.3						
	Capacitance	6.2.3.1	A	O	O	O	A	O
	Insertion loss	6.2.3.2	O	A	A	A	O	A
	Return loss	6.2.3.3	O	O	O	A	O	O
	Longitudinal balance	6.2.3.4	O	O	O	A	O	O
	Bit Error Ratio (BER)	6.2.3.5	O	O	O	O	O	O
	Near-end crosstalk (NEXT)	6.2.3.6	O	O	O	A	O	O
	Mechanical tests	6.3						
	Terminals and connectors	6.3.1	A	A	A	A	A	A
	General testing procedure	6.3.1.1	A	A	A	A	A	A
	Terminals with screws	6.3.1.2	A	A	A	A	A	A
	Screwless terminals	6.3.1.3	A	A	A	A	A	A
	Insulating pierced connections	6.3.1.4	A	A	A	A	A	A
	Pull-out-test on SPD terminals designed for single-core conductors	6.3.1.4.1	A	A	A	A	A	A
	Pull-out-test on SPD terminals designed for multi-core cables and cords	6.3.1.4.2	A	A	A	A	A	A
	Mechanical strength (mounting)	6.3.2	A	A	A	A	A	A

Table 1 (continued)

Test series ⁴	Requirement – Test	Sub-clause	Type of SPD					
			SPD with only voltage-limiting function	SPD with both voltage-limiting and current-limiting functions	SPD with voltage-limiting function and linear component between its terminals	SPD having both voltage-limiting and current-limiting functions with enhanced transmission capabilities	SPD having only voltage-limiting function but intended for use in extended range environment	SPD having both voltage-limiting and current-limiting functions but intended for use in extended range environment
	Resistance to ingress of solid objects and to harmful ingress of water	6.3.3	A	A	A	A	A	A
	Protection against direct contact	6.3.4	A	A	A	A	A	A
	Fire resistance	6.3.5	A	A	A	A	A	A
	Environmental tests	6.4						
	High temperature and humidity endurance	6.4.1	O	O	O	O	A	A
	Environmental cycling with impulse surges	6.4.2	O	O	O	O	A	A
	Environmental cycling with a.c. surges	6.4.3	O	O	O	O	A	A
2	Voltage limiting tests	6.2.1						
	Maximum continuous operating voltage (U_c)	6.2.1.1	A	A	A	A	A	A
	Insulation resistance	6.2.1.2	A	A	A	A	A	A
	Impulse durability for voltage limiting function ¹	6.2.1.6	A	A	A	A	A	A
	Impulse-limiting voltage ²	6.2.1.3	A	A	A	A	A	A
	Impulse reset switching types	6.2.1.4	A	A	A	A	A	A
	AC durability for voltage limiting function ¹	6.2.1.5	O	O	O	O	O	O
	Blind spot test multi stage SPD	6.2.1.8	A	A	A	A	A	A
	Overstressed fault mode	6.2.1.7	A	A	A	A	A	A
3	Current limiting tests	6.2.2						
	Rated current	6.2.2.1	N.A.	A	A	A	N.A.	A
	Series resistance	6.2.2.2	N.A.	A	A	A	N.A.	A
	Current response time	6.2.2.3	N.A.	A	N.A.	A ³	N.A.	A ³
	Current reset time	6.2.2.4	N.A.	A	N.A.	A ³	N.A.	A ³
	Maximum interrupting voltage	6.2.2.5	N.A.	A	N.A.	A ³	N.A.	A ³
	Operating duty test	6.2.2.6	N.A.	A	N.A.	A ³	N.A.	A ³

Table 1 (continued)

Test series ⁴	Requirement – Test	Sub-clause	Type of SPD					
			SPD with only voltage-limiting function	SPD with both voltage-limiting and current-limiting functions	SPD with voltage-limiting function and linear component between its terminals	SPD having both voltage-limiting and current-limiting functions with enhanced transmission capabilities	SPD having only voltage-limiting function but intended for use in extended range environment	SPD having both voltage-limiting and current-limiting functions but intended for use in extended range environment
	AC durability for current limiting function ¹	6.2.2.7	N.A.	A	N.A.	A ³	N.A.	A ³
	Impulse durability for current limiting function ¹	6.2.2.8	N.A.	A	N.A.	A ³	N.A.	A ³
4	Acceptance tests	6.5	O	O	O	O	O	O
<p>A Applicable. N.A. Not applicable. O Optional. ¹ For each category of test impulse a new set of samples can be used. ² It is admissible to measure the impulse-limiting voltage 6.2.1.3 while testing impulse durability 4.2.1.6. ³ Test not applicable if there is a linear component between its terminals. ⁴ Each test series is carried out on three samples.</p>								

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2 Normative references

[SIST EN 61643-21:2002/A1:2009](https://standards.iteh.ai/catalog/standards/sist/4ebd0f7e-cf8a-4cff-b8fa-2dde342442c1/sist-en-61643-21-2002-a1-2009)

Add the following new references: standards.iteh.ai/catalog/standards/sist/4ebd0f7e-cf8a-4cff-b8fa-2dde342442c1/sist-en-61643-21-2002-a1-2009

IEC 61643-12:2008, *Low-voltage surge protective devices – Part 12: Surge protective devices connected to low-voltage power distribution systems – Selection and application principles*

IEC 61643-22:2004, *Low-voltage surge protective devices – Part 22: Surge protection devices connected to telecommunications and signalling networks – Selection and application principles*

IEC 62305-4:2006, *Protection against lightning – Part 4: Electrical and electronic systems within structures*

ITU-T Recommendation K.55:2002, *Overvoltage and overcurrent requirements for insulation displacement connectors (IDC) terminations*

ITU-T Recommendation K.65:2004, *Overvoltage and overcurrent requirements for termination modules with contacts for test ports or SPDs*

ITU-T Recommendation O.9:1999, *Measuring arrangements to assess the degree of unbalance about earth*

Delete the dates from the following references:

IEC 60529, IEC 61000-4-5, IEC 61083-1 and IEC 61643-1.

Delete the following reference:

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*

3 Definitions

Replace 3.8, 3.10, 3.14, 3.15 and 3.22 with:

3.8

surge protective device

SPD

device that restricts the voltage of a designated port or ports, caused by a surge, when it exceeds a predetermined level

NOTE 1 Secondary functions may be incorporated, such as a current-limiting to restrict a terminal current.

NOTE 2 Typically the protective circuit has at least one non-linear voltage-limiting surge protective component.

NOTE 3 An SPD is a complete assembly, having terminals to connect to the circuit conductors.

3.10

current limiting

action of an SPD, containing at least one non-linear current-limiting component, that causes currents exceeding a predetermined value to be restricted

3.14

voltage clamping type SPD

SPD that has high shunt impedance and will have a continuous reduction in impedance with increasing current in response to a voltage surge exceeding the threshold level of the SPD

NOTE Examples of components used in voltage clamping type SPDs: varistors (e.g. MOV) and avalanche breakdown diodes (ABD).

3.15

voltage switching type SPD

SPD that has a high shunt impedance and will have a sudden and large reduction in impedance in response to a voltage surge exceeding the threshold level of the SPD

NOTE Examples of components used in voltage switching type SPDs: air gaps, gas discharge tubes (GDT) and thyristor surge suppressors (TSS).

3.22

rated current

maximum current a current-limiting SPD can conduct continuously with no change in the impedance of the current-limiting components

NOTE This is also applicable to linear series components.

Add the following new definition 3.32:

3.32

surge (telecommunications)

temporary excessive voltage or current, or both, coupled on a telecommunication line, from an external electrical source

NOTE 1 Typical electrical sources are lightning and AC/DC power systems.

NOTE 2 Electrical source coupling can be one or more of the following; electric, magnetic, electromagnetic, conductive.

4.1.1 Normal service conditions

Replace 4.1.1 as follows:

4.1.1.1 Air pressure and altitude

Air pressure is 80 kPa to 106 kPa. These values represent an altitude of +2 000 m to –500 m respectively.

4.1.1.2 Ambient temperature

- normal range: –5 °C to +40 °C

NOTE 1 This range normally addresses SPDs for indoor use. This corresponds to code AB4 in IEC 60364-5-51.

- extended range: –40 °C to +70 °C

NOTE 2 This range normally addresses SPDs for outdoor use in non weather-protected locations, class 3K7 in IEC 60721-3-3.

- storage range: –40 °C to +70 °C

NOTE 3 All values beyond will be specified by the manufacturer.

4.1.1.3 Relative humidity

- normal range: 5 % to 95 %

NOTE 1 This range normally addresses SPDs for indoor use. This corresponds to code AB4 in IEC 60364-5-51.

- extended range: 5 % to 100 %

NOTE 2 This range normally addresses SPDs for outdoor use in non weather-protected locations (e.g. SPD is contained in a weather proofed enclosure).

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4.3 SPD testing

Replace the first two paragraphs by:

The SPDs covered by this standard shall be tested using the connections or terminations that are used when the SPDs are installed in the field. Also, the measurements shall be made at the connections or terminations of the SPDs. For those that are intended to be used with a base or connector, that base or connector shall be part of the tests.

For telecommunication applications ITU-T gives requirements in the K-series for protection holders (K.65) and termination modules (K.55).

When a base is used for testing, the measurements shall be made as close as possible to the terminals of the SPD. Oscilloscopes used for measurements shall be in accordance with IEC 61083-1.

NOTE For oscilloscope settings, see Annex D.

SPDs of Figures 1c, 1e and 1f may have a common current path (including protective components or just internal connections) that conducts the total impulse current. The manufacturer shall state the maximum value of impulse current for this current path. This value of impulse current may be less than n times the maximum current capability of each line terminal, where n equals the number of line terminals.

These SPDs shall have all of their line terminals tested simultaneously with respect to the common terminal.

5.2.1.1 Maximum continuous operating voltage (U_c)

Replace by:

5.2.1.1 Maximum continuous operating voltage (U_c)

The manufacturer shall state the maximum continuous operating voltage for the SPD appropriate for the application such as AC rms or DC.

Compliance shall be checked in accordance with 6.2.1.1.

5.2.3 Transmission requirements

Replace by:

5.2.3 Transmission requirements

The SPD, in addition to the requirements of 5.2.1 and 5.2.2, may need to conform to specific requirements of 5.2.3 depending on its communication and signalling application (for example, voice, data, and video). Table 1 provides guidance in the selection of applicable transmission tests.

6.2.1.3 Impulse-limiting voltage

Replace the first paragraph by:

The SPDs shall be tested using one impulse selected from category C of Table 3 and applied to the appropriate terminals. The current level shall be selected based on the energy capability of the SPD as determined in the impulse durability test (see 6.2.1.6). Both impulse-limiting voltage and impulse durability tests shall be performed with the same impulse. Values listed in Table 3 are minimum requirements; other surge current ratings can be found in standards e.g. ITU-T Recommendations.

Replace the fourth paragraph by:

Measure the voltage limitation for each impulse without load. The maximum voltage measured at the appropriate terminals shall not exceed the specified voltage protection level (U_p). Sufficient time shall be allowed between impulses to prevent accumulation of heat. It is understood that different SPDs will have different thermal characteristics, and consequently will require different times between impulses.

For detail impulse recorders settings refer to Annex D.