



SLOVENSKI STANDARD SIST-TP CLC/TR 50656:2016

01-april-2016

Uporaba SPD v povezavi z opremo razreda II

SPD application in conjunction with Class II equipment

SPD Anwendungen in Verbindung mit Schutzklasse II

Parafoudres destinés à être utilisés avec des équipements classe II

Ta slovenski standard je istoveten z: **CLC/TR 50656:2016**

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ICS:

29.120.50	Varovalke in druga medtokovna zaščita	Fuses and other overcurrent protection devices
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March 2016

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English Version

SPD application in conjunction with Class II equipment

Parafoudres destinés à être utilisés avec des équipements
classe II

SPD Anwendungen in Verbindung mit Schutzklasse II

This Technical Report was approved by CENELEC on 2015-12-14.

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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/TR 50656:2016) has been prepared by CLC/TC 37A “Low voltage surge protective devices”.

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CLC/TR 50656:2016 (E)**Introduction**

Based on questions and requests from the field it was felt necessary to provide some guidance and instructions how and in which applications currently available SPDs according to EN 61643-11 can be correctly and safely applied in conjunction with class II equipment and in installations, where the protective measure double or reinforced insulation is applied (see HD 60364-4-41 and EN 61140).

In general current SPDs according EN 61643-11 are designed to properly protect wherever:

- basic insulation is required e.g. between active parts and the protective equipotential bonding system (PE) (the SPD bridges basic insulation in such applications);
- basic or functional insulation is required e.g. between active parts of different potential (the SPD bridges basic or functional insulation in such applications).

The requirements currently contained in EN 61643-11 do not cover requirements for SPD applications, where the SPD bridges double or reinforced insulation, like e.g. between primary and secondary side of an isolating transformer (protective separation) or between active parts and touchable conductive surfaces of class II equipment.

There are attempts to develop requirements for such SPDs, but for the time being there is no defined solution.

This document refers to HD 60364-4-41 for topics related to installation rules and to EN 62368-1 for some equipments related topics.

This document specially addresses installation issues related to street lighting.

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1 Scope

In addition to CLC/TS 61643-12, this Technical Report describes the principle of erecting SPDs to be connected to 50 Hz a.c. power circuits, rated up to 1 000 V r.m.s. in conjunction with Class II equipments.

In addition to EN 61643-11, this Technical Report gives specific guidance for SPDs intended to be installed in class II equipments.

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 50539-11:2013, *Low-voltage surge protective devices - Surge protective devices for specific application including d.c. - Part 11: Requirements and tests for SPDs in photovoltaic applications*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*¹

EN 60664-1, *Insulation coordination for equipment within low-voltage systems — Part 1: Principles, requirements and tests (IEC 60664-1)*²

EN 60950-1, *Information technology equipment — Safety — Part 1: General requirements (IEC 60950-1)*³

EN 61643-11:2012, *Low-voltage surge protective devices — Part 11: Surge protective devices connected to low-voltage power systems — Requirements and test methods (IEC 61643-11:2011)*⁴

EN 62368-1:2014, *Audio/video, information and communication technology equipment — Part 1: Safety requirements (IEC 62368-1:2014, modified)*⁵

HD 60364 (all parts), *Low-voltage electrical installations (IEC 60364) all parts*⁶

3 Terms and definitions

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

1

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http://www.cenelec.eu/dyn/www/f?p=104:110:1457986987015001:::FSP_ORG_ID,FSP_PROJECT,FSP_LANG_ID:1257189,53711,25

http://www.cenelec.eu/dyn/www/f?p=104:110:592568428155801:::FSP_ORG_ID,FSP_PROJECT,FSP_LANG_ID:1258617,43963,25

http://www.cenelec.eu/dyn/www/f?p=104:110:785888442943801:::FSP_ORG_ID,FSP_PROJECT,FSP_LANG_ID:1257189,60205,25

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CLC/TR 50656:2016 (E)

3.1 SPD assembly
one SPD or a set of SPDs, in both case including all SPD disconnectors required by the SPD manufacturer, providing the required overvoltage protection for a type of system earthing

[SOURCE: IEC 60364-5-53, modified]

3.2 extraneous conductive part
conductive part not forming part of the electrical installation and liable to introduce an electric potential, generally the electric potential of a local earth

[SOURCE: IEC 60050-826]

3.3 functional earth
earthing a point or points in a system or in an installation or in equipment, for purposes other than electrical safety

[SOURCE: EN 62368-1:2014]⁵


3.4 class II SPD
SPDs in which protection against electric shock does not rely on basic insulation only, but in which additional safety precautions such as double insulation or reinforced insulation are provided, there being no provision for protective earthing or reliance upon installation conditions

Note 1 to entry: Such a SPD may have a substantially continuous enclosure of metal, insulated from live parts by insulation at least equivalent to double or reinforced insulation. Such a SPD is called a metal-encased class II SPD.

Note 2 to entry: The enclosure of an insulation-encased class II SPD may form a part or the whole of the supplementary insulation or the reinforced insulation.

Note 3 to entry: If a SPD with double insulation and/or reinforced insulation throughout has a protective earthing, it is class I construction,

Note 4 to entry: Class II SPD may have parts in which protection against electric shock relies on operation at safety extra-low voltage (SELV).

Note 5 to entry: Such SPDs should be marked with the symbol .

[SOURCE: EN 60598-1:2015, modified]⁷

3.5 protective earthing
earthing a point or points in a system or in an installation or in equipment for purposes of electrical safety

[SOURCE: EN 62368-1:2014, modified]⁵

3.6 protective conductor
conductor provided for the purposes of safety (for example, protection against electric shock)

⁷

http://www.cenelec.eu/dyn/www/f?p=104:110:1827578021514001:::FSP_ORG_ID,FSP_PROJECT,FSP_LA NG_ID:1257233,50934,25

Note 1 to entry: A protective conductor is either a protective earthing conductor or a protective bonding conductor.

[SOURCE: EN 62368-1:2014]⁵

3.7

protective earthing conductor

protective conductor connecting a main protective earthing terminal in the equipment to an earth point in the building installation for protective earthing

[SOURCE: EN 62368-1:2014]⁵

4 SPDs connected to PE for the protection of Class II equipments

4.1 General

In the four following examples, a Class II equipment is integrated into a conductive metallic housing that is connected to PE (i.e. Class I equipment), whereby the protective measures according to HD 60364-4-41:2007, Clause 411 are effective.

The three first following examples describe the recommended location and protection measures against electric shock for SPD assembly used to protect Class II equipment connected to TN, TT and IT power systems.

The forth example is dedicated to special application: metallic street lighting pole.

The SPD used in such installation shall comply with EN 61643-11.

The installation rules described in HD 60364-5-534 shall be applied, and in addition the rules related to surge protection described in CLC/TS 61643-12 are applicable.

A dedicated conductor between the PE and SPD fulfilling the HD 60364-4-41:2007, 411.3.1.1 measures against electric shock is required.

Alternatively, the metal conductive housing itself enclosing the SPD and the Class II equipment, may be used as protective conductors if they simultaneously satisfy the following three requirements:

- a) their electrical continuity should be ensured by construction or by suitable connection so as to ensure protection against mechanical, chemical or electrochemical deterioration;
- b) they comply with the requirement of minimum cross section area according to HD 60364-5-54:2011, 543.1
- c) they should permit the connection of other protective conductors at every predetermined tap off point.

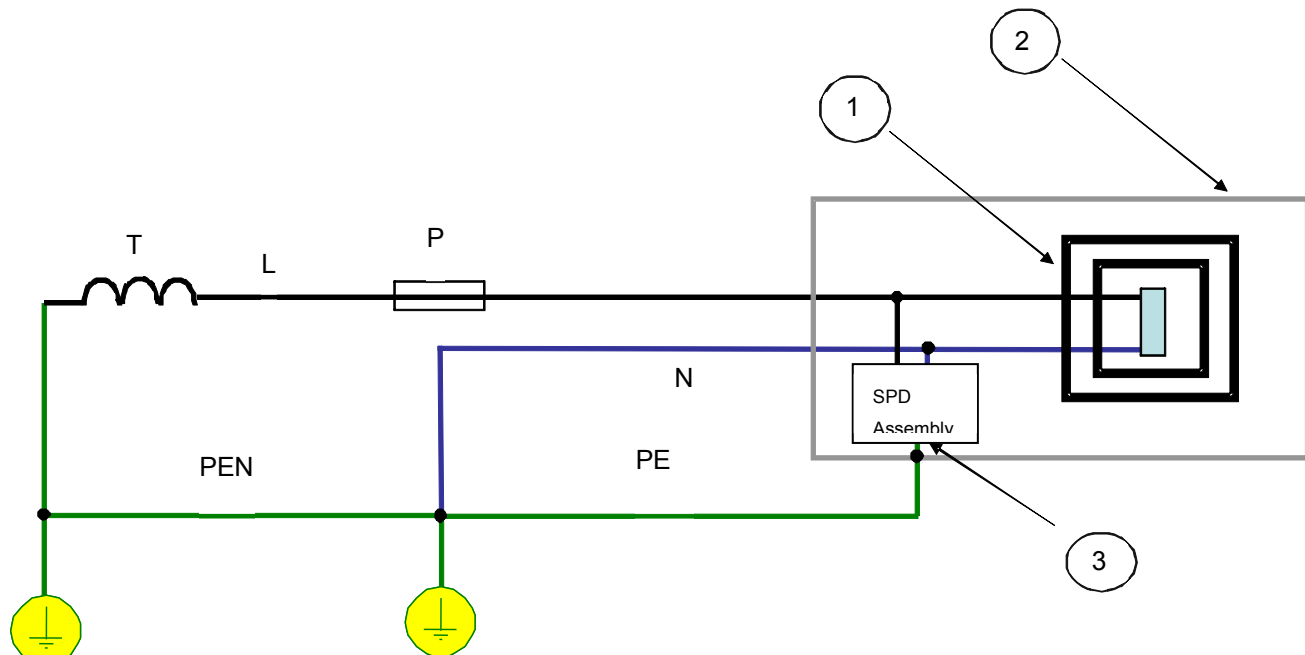
Additional requirements are given in HD 60364-5-54:2011, 543.2 and 543.3.

Nevertheless, an additional functional bonding connection as short as possible can be used to ensure a better surge protection provided by the SPD.

In the following pictures, the overcurrent protection is only shown if it is required as protective measure against electrical shock.

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4.2 TN System



Key

- T transformer
 P protection measures against electric shock (i.e. Fuse or Breaker). Automatic disconnection according to HD 60364-4-41:2007, 411.4
 1 class II equipment
 2 conductive housing
 3 direct connection to PE

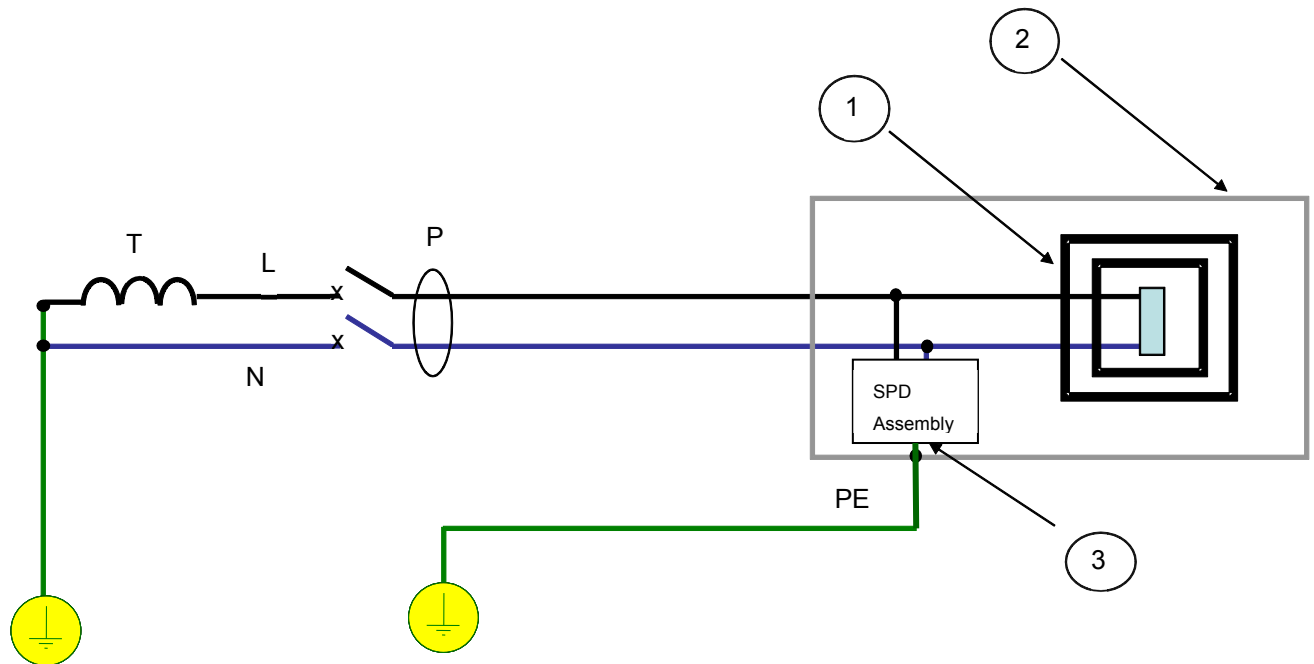
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Figure 1 — Example of SPDs connected to PE protecting Class II equipments in TN System

4.3 TT System

**Key**

T transformer

P protection measures against electric shock (i.e., RCD) Automatic disconnection according to HD 60364-4-41:2007, 411.5

1 class II equipment

2 conductive housing

3 direct connection to PE

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