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INTERNATIONAL STANDARD

Audio/video, information and communication technology equipment - Safety - Power transfer between communication equipment ports using communication wires and cables cabling at non-mains voltage above 60 V DC and ES2/ES3 AC voltage

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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IEC 63316 was prepared by IEC Technical Committee 108: Safety of electronic equipment within the field of audio/video, information technology and communication technology. It is an International Standard.

This first edition cancels and replaces Clause 6 of IEC 62368-3 published in 2017. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to Clause 6 of IEC 62368-3 published in 2017:

a) DC power transfer at voltages above 60 V DC but ≤ 120 V DC (ES2), including telecommunications networks formerly known as TNV-3;

b) DC power transfer at voltages ≥ 120 V DC at ES3, such as RFT circuits and associated telecommunications equipment;

c) AC/DC remote powering above ES1 over coaxial cable in cable television utility service provider circuits for repeaters, amplifiers, and ONUs;

d) clarification on communication cable permitting power transfer, regardless of data transmission presence.

The text of this International Standard is based on the following documents:

Draft	Report on voting
108/856/FDIS	108/858/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

In this document, the following print types are used:

– compliance statements: *italic type*;

– terms defined in Clause 3: **bold type**.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,

– withdrawn, or

– revised.

1 Scope

This document prescribes **safeguards**, test methods and compliance requirements intended to reduce the risk of electrical shock and fire associated with voltage and current at voltages greater than 60 V DC and 60 V AC.

This document applies to equipment ports intended to supply and receive operating power from communications equipment ports using communication wires and cables. It covers particular requirements for circuits that are designed to transfer AC or DC power from a **power sourcing equipment (PSE)** (3.1.2) to a **powered device (PD)** (3.1.3), including repeaters, amplifiers, Optical Network Units, Remote DSLAMs, service provider terminating equipment, remote telecommunications cabinets and equipment, and midspan passive equipment connected to the **PSE** (3.1.2) and **PD** (3.1.3).

The power transfer of equipment ports covered by this document uses non-**mains** AC voltage or non-**mains** DC voltage above 60 V DC classified as ES2 according to 5.2.1.2 of IEC 62368-1:2023 or, in some very controlled cases, classified as ES3 according to IEC 62368-1:2023.

EXAMPLES

- DC power transfer using voltages above 60 V DC but ≤ 120 V DC, classified as ES2;
- Some telecommunications networks where the voltage was formerly called TNV-3 (see IEC 62368-1:2023, Table W.3), typically used for line, span or express powering outside North America, Long Range Reverse Power Feeding, HDSLx line powering ISDN, Line Powering Primary Rate E1;
- Some North American telecommunications networks between the utility service providers´ **PSE** (3.1.2) and service providers side of the **PD** (3.1.3) at the **PNI** (3.1.8);
- For DC power transfer using voltages ≥ 120 V DC at ES3: **RFT circuits** and the associated telecommunications network equipment and cabling used by communications service providers and communications utilities (for example, line powered E1/T1, HDSLx, SHDSLx, xDSL, repeaters, and telecommunications line powering up or line powering down converters as applicable), Optical Network Units, remote DSLAMs, etc. These **RFT circuits** are used between the utility service providers **PSE** (3.1.2) and service providers side of the **PD** (3.1.3) at the **PNI** (3.1.8). The customer facing ports of this equipment are at voltage not exceeding 60 V DC and are covered by IEC 62368-1:2023, see Annex A for deployment topologies;
- For AC/DC remote powering voltage above ES1 over coaxial cable in circuits used by cable television utility service providers for repeaters, amplifiers, Optical Network Units. The customer facing ports of this equipment are at voltage not exceeding 60 V DC that are covered by IEC 62368-1:2023.

NOTE 1 Any communications cable that permits power transfer between communication equipment is considered a communication cable even if communication does not take place. For example, a line powering up or line powering down converters as applicable used to power remote telecommunications equipment, can provide limited communications **RFT** power and not necessarily any superimposed data or signalling.

This document does not cover equipment interfaces within the scope of IEC 63315.

NOTE 2 IEC 63315 covers equipment intended to either supply or receive charging, or operating power from ICT interfaces using ICT wires and cables such as PoE, USB, HDMI, etc, or any of these combined.

This document does not cover ringing signals that are in the scope of IEC 62368-1 or in the scope of IEC 62949:2017.

This document does not cover traditional telecommunications technologies which operate at voltages not exceeding 60 V DC (circuits classified as ES1 according to 5.2.1.1 of IEC 62368-1:2023 and Table ID1a, 1b, or 1c in Table 13 of IEC 62368-1:2023) with or without ringing signals (classified as ES2 according to 5.2.1.1 of IEC 62368-1:2023 and **external circuit** ID1a, 1b, or 1c in Table 13 of IEC 62368-1:2023). Examples of traditional telecommunications technologies include Analogue Telephony, ISDN, T1, E1, VDSL, SHDSL, DDS, etc.

This document does not cover communications over **mains** and high-voltage power transmission and distribution lines.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60695-11-5:2016, *Fire hazard testing - Part 11-5: Test flames - Needle-flame test method - Apparatus, confirmatory test arrangement and guidance*

IEC 60728-11:2023, *Cable networks for television signals, sound signals and interactive services - Part 11: Safety*

IEC 62368-1:2023, *Audio/video, information and communication technology equipment - Part 1: Safety requirements*

Bibliography

[1] ISO/IEC/IEEE 8802-3:2021, *Telecommunications and exchange between information technology systems - Requirements for local and metropolitan area networks - Part 3: Standard for Ethernet*

[2] IEC 63044-3:2017, *Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) - Part 3: Electrical safety requirements*
IEC 63044-3:2017/AMD1:2021

[3] ITU-T K.50:2018, *Safe limits for operating voltages and currents of telecommunication systems powered over the network*

[4] IEC 60050-442:1998, *International Electrotechnical Vocabulary (IEV) - Part 442: Electrical accessories*

[5] IEC TS 60479-1:2018, *Effects of current on human beings and livestock - Part 1: General aspects*

[6] Telcordia GR-1089-CORE, *Electromagnetic Compatibility (EMC) and Electrical Safety - Generic Criteria for Network Telecommunications Equipment*

[7] UL 2391:2002, *Outline of Investigation for Equipment with Remote Feeding Telecommunication Circuits Intended for Backwards Compatibility in Legacy Telecommunication Equipment*

[8] ATIS 0600337, *Requirements for Maximum Voltage, Current, and Power Levels Used in Communications Circuits*

[9] NFPA 70, *National Electrical Code*

[10] DIN VDE 0800-3, *Information technology - Part 3: Safety of installations with remote power feeding*

[11] UL 60950-1, *Information Technology Equipment - Safety - Part 1: General Requirements*

[12] UL 62368-1, *Audio/video, information and communication technology equipment - Part 1: Safety requirements*

[13] IEC TS 60479-1:2005[1], *Effects of current on human beings and livestock - Part 1: General aspects*
IEC TS 60479-1:2005/AMD1:2016

[14] ITU-T K.64, *Safe working practices for outside equipment installed in particular environments*

[15] IEC 60479-2, *Effects of current on human beings and livestock - Part 2: Special aspects*

[16] IEC 63315, *Audio/Video, Information and Communication Technology Equipment - Safety - DC power transfer between ICT equipment ports using ICT wiring and cables at ≤ 60 V DC*

[17] IEC 62949, *Particular safety requirements for equipment to be connected to information and communication technology networks*

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[1] This publication was withdrawn and replaced with IEC TS 60479-1:2018.