SLOVENSKI STANDARD
oSIST prEN IEC 61010-2-203:2022

01-maj-2022

Varnostne zahteve za električno opremo za meritve, nadzor in laboratorijsko uporabo - 2-203. del: Posebne zahteve za industrijska komunikacijska vezja in povezovanje komunikacijskih vrat

Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-203: Particular requirements for industrial communication circuits and communication port interconnection

Règles de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire - Partie 2-203: Règles particulières concernant les circuits de communication industriels et l'interconnexion des ports de communication

Ta slovenski standard je istoveten z: **prEN IEC 61010-2-203:2022**

ICS:

19.080	Električno in elektronsko preskušanje	Electrical and electronic testing
71.040.10	Kemijski laboratoriji. Laboratorijska oprema	Chemical laboratories. Laboratory equipment

oSIST prEN IEC 61010-2-203:2022 **en,fr,de**

65/914/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 61010-2-203 ED1**	
DATE OF CIRCULATION: **2022-03-18**	CLOSING DATE FOR VOTING: **2022-06-10**
SUPERSEDES DOCUMENTS: **65/824/CD, 65/850A/CC**	

IEC TC 65 : INDUSTRIAL-PROCESS MEASUREMENT, CONTROL AND AUTOMATION	
SECRETARIAT: France	SECRETARY: Mr Didier GIARRATANO
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 66	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY	
☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-203: Particular requirements for industrial communication circuits and communication port interconnection

PROPOSED STABILITY DATE: 2028

NOTE FROM TC/SC OFFICERS:

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

SAFETY REQUIREMENTS FOR ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL AND LABORATORY USE –

Part 2-203: Particular requirements for industrial communication circuits and communication port interconnection

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.

2) The formal decisions or agreements of 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 IEC National Committees.

3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.

4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.

5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.

6) All users should ensure that they have the latest edition of this publication.

7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.

8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61020-2-203 has been prepared by committee TC 65: Industrial-process measurement and automation.

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

FDIS	Report on voting
65/XX/FDIS	XX/XX/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 2.

This Part 2-203 is to be used in conjunction with the latest edition of IEC 61010-1. It was established on the basis of IEC 61010-1 Edition 3.1.

The Annex(ex) form an integral part of this standard.

The committee has decided that the contents of this publication 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

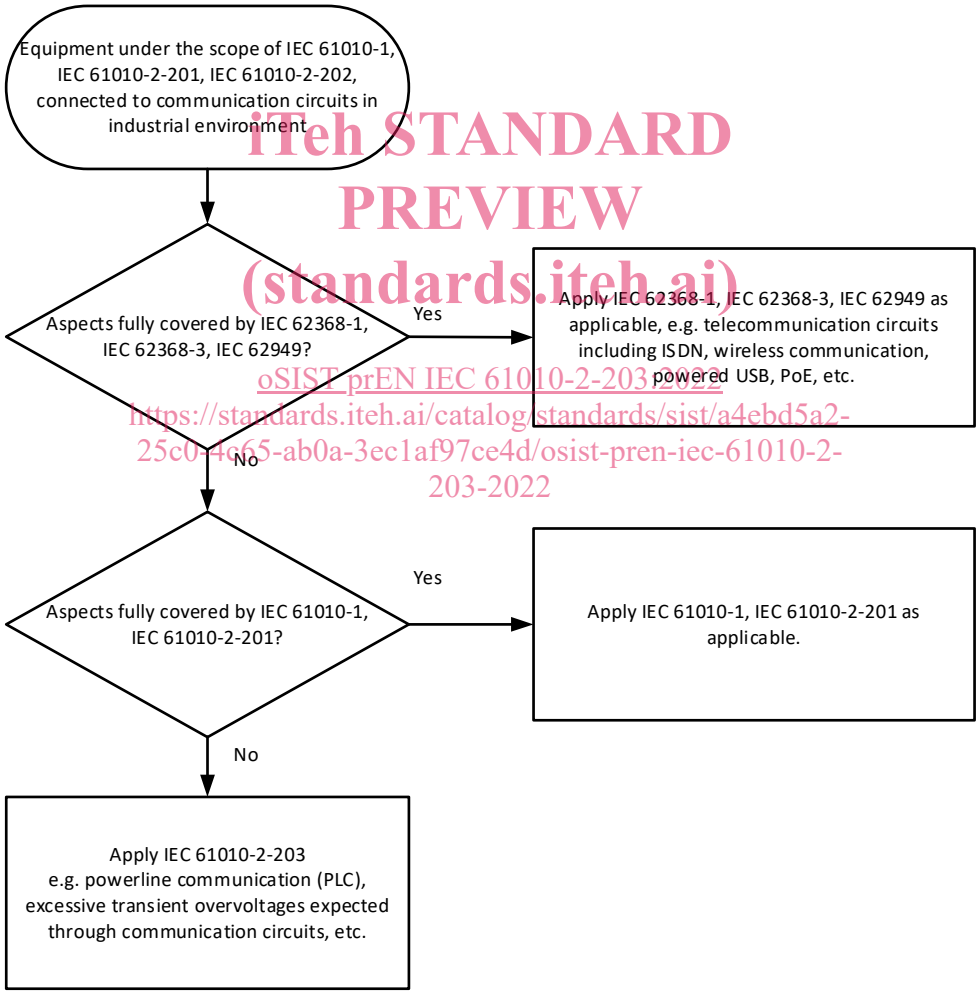
IEC 61010-2-2xx documents are a series of standards on safety of industrial-process measurement, control and automation equipment.

Safety terms of general use are defined in IEC 61010-1. More specific terms are defined in each part.

Part 2-203 incorporates the safety related requirements for industrial COMMUNICATION CIRCUITS.

This document compliments IEC 62368-1, where IEC 62368-1 applies to domestic and commercial equipment, covering mostly one-to-one connections without considering the whole communication network that can contain several COMMUNICATION PROTOCOLS.

Thus, industrial COMMUNICATION CIRCUITS might require additional consideration based on the expected transients of interconnected equipment, where the equipment is supplied from different mains with different overvoltage categories (OVC), or where environmental factors may affect the COMMUNICATION CIRCUITS.



Additional requirements for equipment having the capability to supply DC power over commonly used communication cables, such as USB or Ethernet (PoE), are given in IEC 62368-3.

Additional requirements for equipment acting as communication end device connected to information and communication networks, where no further interfaces to other nets need to be considered, are covered in IEC 62949.

SAFETY REQUIREMENTS FOR ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL AND LABORATORY USE –

Part 2-203: Particular requirements for industrial communication circuits and communication port interconnection

1 Scope and object

This clause of Part 1 is applicable, except as follows.

1.1.1 Equipment included in scope

Replacement:

Replace the text by the following paragraphs:

This part of IEC 61010 specifies:

This part of IEC 61010 specifies particular safety requirements for industrial COMMUNICATION CIRCUITS and their INTERCONNECTION where equipment is intended to be installed in a process or discrete control environment.

NOTE – The equipment could be connected to an overall communication network.

These include COMMUNICATION CIRCUITS and INTERCONNECTIONS which are part of electrical test and measurement equipment or process control equipment, where these are intended to be used in an industrial environment.

Type of COMMUNICATION CIRCUITS covered:

NOTE – Any industrial process control equipment can have more than one COMMUNICATION CIRCUIT.

– COMMUNICATION CIRCUITS with COMMUNICATION PROTOCOLS below 50 V r.m.s., 70 V peak and 120 V DC, where the COMMUNICATION CIRCUIT is expected to be exposed to excessive transients in the end use installation.

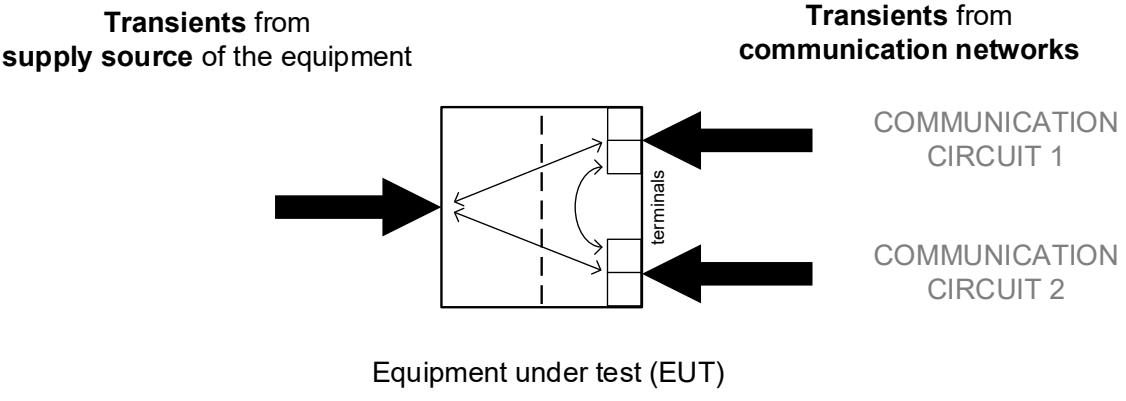


Figure 1 – Equipment under test (EUT)

NOTE 1 – Excessive overvoltage transients can occur from the equipment supply sources or from COMMUNICATION CIRCUIT terminals. A mismatch of overvoltage transients for equipment interconnected through a COMMUNICATION CIRCUIT can result in an electrical shock hazard.

NOTE 2 – Excessive overvoltage transients through the supply sources can occur in COMMUNICATION PROTOCOLS of secondary circuits when the expected overvoltage transient from the supply source may be equal to or exceed 2500 V peak.

Example:

- Supply from an OVC III supply source, with a line to neutral voltage exceeding 150 V r.m.s.
- Supply from an OVC II supply source, with a line to neutral voltage exceeding 300 V r.m.s.

NOTE 3 – Excessive overvoltage transients through COMMUNICATION CIRCUIT terminal inputs can be caused by environmental factors or equipment connected to an overall communication network.

Example:

Cables / wiring between transmitting and receiving equipment, can act as an antenna and expose a risk of higher transients from environmental factors, e.g. lightning strikes.

COMMUNICATION CIRCUITS can experience excessive transients from the remote COMMUNICATION CIRCUIT terminal outputs from interconnected equipment.

NOTE 4 – SELV and PELV communication cables / wiring between equipment located in the same building are generally considered to not be subjected to external transients due to reduced environmental influences.

– COMMUNICATION CIRCUITS with COMMUNICATION protocols below 50 V r.m.s., 70 V peak and 120 V DC;

– In addition, where the equipment contains connection to multiple different COMMUNICATION CIRCUITS, where the interconnection of these different COMMUNICATION CIRCUITS can create voltages (differential mode) exceeding 50 V r.m.s., 70 V peak and 120 V DC.

COMMUNICATION CIRCUITS not classified in one of the circuit types above, are excluded, and not covered by the scope and requirements of this document.

1.1.2 Equipment excluded from scope

Replacement:

Replace the text by the following paragraphs:

This standard does not apply to equipment within the scope of:

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

Additionally, this standard does not apply to COMMUNICATION CIRCUITS within the scope of

– IEC 62368-3 Audio/video, information and communication technology equipment – Part 3: Safety aspects for DC power transfer through communication cables and ports

– IEC 62949 Particular safety requirements for equipment to be connected to information and communication technology networks

– IEC 60825-2 Safety of laser products - Part 2: Safety of optical fibre communication systems (OFCS)

1.2.2 Aspects excluded from scope

This standard does not cover:

a) Optical or wireless interfaces resp. COMMUNICATION CIRCUITS.

b) Requirements for protection against the effects of direct lightning strikes.

2 Normative references

This clause of Part 1 is applicable.

3 Terms and definitions

This clause of Part 1 is applicable, except as follows:

Add the following terms and definitions:

3.101.1
SECONDARY CIRCUIT
circuit where separation from MAINS CIRCUITS is achieved by a transformer in which the primary windings are separated from the secondary windings by REINFORCED INSULATION, DOUBLE INSULATION, or a screen connected to the PROTECTIVE CONDUCTOR TERMINAL.

The secondary circuit has no direct conductive connection to a MAINS CIRCUITS and derives its power from a transformer, converter or equivalent isolation device, or from a small battery.

Note to entry - These circuits are assumed to be subjected to 1 overvoltage category lower TRANSIENT OVERVOLTAGE levels than the MAINS CIRCUITS.

3.101.2
SAFETY EXTRA-LOW VOLTAGE CIRCUIT
SELV CIRCUIT
non-protective earth referenced electrical circuit in which the voltage cannot exceed the following:

NORMAL CONDITION and SINGLE FAULT CONDITION: The AC voltage levels are 30 V r.m.s., 42,4 V peak and the DC voltage level is 60 V. For equipment intended for use in WET LOCATIONS, the AC voltage levels are 16 V r.m.s., 22,6 V peak and the DC. voltage level is 35 V.

Note to entry - Transients are not considered in SELV (OVC I circuits), where these are derived from circuits supplied from OVC II, below 300 V line to neutral voltage.

[SOURCE: IEC 60050-826-12-31:2004, modified – clarified and more fully described]

3.101.3
PROTECTIVE EXTRA-LOW VOLTAGE CIRCUIT
PELV CIRCUIT
protective earth referenced electrical circuit in which the voltage cannot exceed the following:

NORMAL CONDITION and SINGLE FAULT CONDITION: The AC voltage levels are 30 V r.m.s., 42,4 V peak and the DC voltage level is 60 V. For equipment intended for use in WET LOCATIONS, the AC voltage levels are 16 V r.m.s., 22,6 V peak and the DC. voltage level is 35 V.

Note to entry - Transients are not considered in PELV (OVC I circuits), where these are derived from circuits supplied from OVC II, below 300 V line to neutral voltage.

[SOURCE: IEC 60050-826-12-31:2004, modified – clarified and more fully described]

3.101.4
COMMUNICATION CIRCUIT
circuit that is in the equipment and to which the accessible area of contact is limited and that is so designed and protected that, under normal conditions and single fault conditions, the voltages do not exceed specified limit values.

NOTE 1 to entry – See Annex AA for COMMUNICATION PROTOCOLS and their specified limit values.

NOTE 2 to entry – A COMMUNICATION CIRCUIT is considered to be a secondary circuit derived from another secondary circuit in this standard.

NOTE 3 to entry – A COMMUNICATION CIRCUIT can be part of an overall COMMUNICATION NETWORK.

3.101.5
COMMUNICATION NETWORK
metallically terminated transmission medium intended for communication between equipment that may be located in separate buildings, excluding:

– the mains system for supply, transmission and distribution of electrical power, if used as a communication transmission medium;

– cable distribution systems;

– SELV CIRCUITS

NOTE 1 to entry - The term COMMUNICATION NETWORK is defined in terms of its functionality, not its electrical characteristics. A COMMUNICATION NETWORK is not itself defined as being either an SELV circuit or a COMMUNICATION CIRCUIT. Only the circuits in the equipment are so classified.

NOTE 2 to entry: Cable for COMMUNICATION NETWORK consists of two or more conductors intended for communication and/or power transfer between the various pieces of equipment. The equipment may be located within the same or separate structures, buildings or locations, excluding:
– the mains system for supply, transmission and distribution of electrical power, if used as a communication transmission medium;

- this may include twisted pairs, and may include circuits, that are subjected to transient overvoltages of up to 1,5 kV. This may be 2kV in critical industrial environment, e.g. close to a welding machine.

NOTE 3 to entry: For information about circuit voltages and signals which may be present, see Annex B of IEC 62949:2017.

NOTE 4 to entry - A COMMUNICATION NETWORK may be:
– publicly or privately owned;
– subject to transient overvoltages due to atmospheric discharges and faults in power distribution systems;
– subject to longitudinal (common mode) voltages induced from nearby power lines or electric traction lines.

NOTE 5 to entry - Examples of COMMUNICATION NETWORKS are:
– level meters connected to a control room via Ethernet for monitoring the liquid level of tanks in a chemical plant;
– a bottling plant build-up via fieldbuses for control and diagnoses;
– a waste incineration plant interconnected via different COMMUNICATION CIRCUITS as SDCI (Single-drop digital communication interface) and RS485
for emergency shut-downs of discrete parts;
– a data network of an industrial facility, as those specified in IEC 61784-1, IEC 61784-2, whose installation is specified in IEC 61918 and detailed in IEC 61784-5 series of installation profiles.

[SOURCE: IEC 62368-3 ed 1.0 (2017-12), information and communication technology network ICT network definition modified]

3.101.6

COMMUNICATION VOLTAGE

maximum signal voltage utilized to transfer information

Note: for the communication techniques listed in Annex AA the physical interface is mostly fixed. But to almost all protocols named there,
special physical interfaces can be used i.e. for the purpose to use the mains distribution system as communication media.

3.101.7

COMMUNICATION CIRCUIT TRANSIENT OVERVOLTAGE

highest peak voltage expected at the COMMUNICATION CIRCUIT connection point of the equipment, arising from external transients.

Note to entry - The effect of transients from cable distribution systems is not taken into account.

[SOURCE: IEC 60950-1 ed 2.0 (2005-12), telecommunication network transient voltage definition modified]

4 Tests

This clause of Part 1 is applicable.

5 Marking and documentation

This clause of Part 1 is applicable, except as follows:

5.1.3 Mains supply

Addition:

Add the following new symbol in Table 1.

Table 1 – Symbols

Number	Symbol	Reference	Description
101		IEC 60417-5021 (2002-10).	equipotential bonding terminal

5.1.5 **TERMINALS, connections and operating devices**

Add a new subclause: