SVENSK STANDARD SS-EN 61010-2-201

Fastställd	Utgåva	Sida	Ansvarig kommitté
2013-07-03	1	1 (1+56)	SEK TK 65

Elektrisk utrustning för mätning, styrning och för laboratorieändamål – Säkerhet – Del 2-201: Särskilda fordringar på styr- och reglerutrustning

Safety requirements for electrical equipment for measurement, control and laboratory use – Part 2-201: Particular requirements for control equipment

Som svensk standard gäller europastandarden EN 61010-2-201:2013. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61010-2-201:2013.

Nationellt förord

Europastandarden EN 61010-2-201:2013

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 61010-2-201, First edition, 2013 - Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-201: Particular requirements for control equipment**

utarbetad inom International Electrotechnical Commission, IEC.

Standarden ska användas tillsammans med SS-EN 61010-1, utgåva 3, 2010.

Standarden ersätter delvis SS-EN 61131-2, utgåva 3, 2007.

De avsnitt som behandlar säkerhet, främst avsnitt 11 – 14 i tidigare fastställd svensk standard SS-EN 61131-2, utgåva 3, 2007 gäller ej fr o m 2016-04-01.

ICS 13.110.00; 17.020.00; 19.020.00; 25.040.40

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
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Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

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SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61010-2-201

May 2013

ICS 13.110; 17.020; 19.020; 25.040.40

Supersedes EN 61131-2:2007 (partially)

English version

Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-201: Particular requirements for control equipment

(IEC 61010-2-201:2013)

Règles de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire - Partie 2-201: Exigences particulières pour les équipements de commande (CEI 61010-2-201:2013)

Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte - Teil 2-201: Besondere Anforderungen für Steuer- und Regelgeräte (IEC 61010-2-201:2013)

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 61010-2-201:2013 E

SEK Svensk Elstandard

Foreword

The text of document 65/515/FDIS, future edition 1 of IEC 61010-2-201, prepared by IEC TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61010-2-201:2013.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2014-01-01
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2016-04-01

This document partially supersedes EN 61131-2:2007.

This Part 2-201 is intended to be used in conjunction with EN 61010-1:2010. Consideration may be given to future editions of, or amendments to, EN 61010-1.

This Part 2-201 supplements or modifies the corresponding clauses in EN 61010-1 so as to convert that publication into the European standard: *Particular requirements for control equipment*.

Where a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. Where this part states “addition”, “modification”, “replacement”, or “deletion”, the relevant requirement, test specification or note in Part 1 should be adapted accordingly.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

Endorsement notice

The text of the International Standard IEC 61010-2-201:2013 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60079 series	NOTE	Harmonised in EN 60079 series.
IEC 60364 series	NOTE	Harmonised in HD 60364 series.
IEC 60364-4-41	NOTE	Harmonised as HD 60364-4-41.
IEC 60664-5:2007	NOTE	Harmonised as EN 60664-5:2007 (not modified).
IEC 60715:1981 + A1:1995	NOTE	Harmonised as EN 60715:2001 (not modified).
IEC 60721-2-3:1987	NOTE	Harmonised as HD 478.2.3 S1:1990 (not modified).
IEC 61131-2:2007	NOTE	Harmonised as EN 61131-2:2007 (not modified).
IEC 61131-6:2012	NOTE	Harmonised as EN 61131-6:2012 (not modified).
IEC 61140:2001	NOTE	Harmonised as EN 61140:2002 (not modified).
IEC 61326 series	NOTE	Harmonised in EN 61326 series.

IEC 61508 series	NOTE	Harmonised in EN 61508 series.
IEC 61643 series	NOTE	Harmonised in EN 61643 series.
IEC 61643-21	NOTE	Harmonised as EN 61643-21.
IEC 61643-311	NOTE	Harmonised as EN 61643-311.
IEC 61643-321	NOTE	Harmonised as EN 61643-321.
IEC 61643-331	NOTE	Harmonised as EN 61643-331.
IEC 61800 series	NOTE	Harmonised in EN 61800 series.
IEC 62133:2002	NOTE	Harmonised as EN 62133:2003 (not modified).
IEC 62368 series	NOTE	Harmonised in EN 62368 series.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Addition *to Annex ZA of EN 61010-1:2010:*

Publication	Year	Title	EN/HD	Year
IEC 60068-2-31	2008	Environmental testing - Part 2-31: Tests - Test Ec: Rough handling shocks, primarily for equipment-type specimens	EN 60068-2-31	2008
IEC 60384-14	2005	Fixed capacitors for use in electronic equipment - Part 14: Sectional specification - Fixed capacitors for electromagnetic interference suppression and connection to the supply mains	EN 60384-14	2005
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60695-2-11 + corr. January	2000 2001	Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end-products	EN 60695-2-11	2001
IEC 60947-5-1	2003	Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices	EN 60947-5-1 + corr. July	2004 2005
IEC 60947-7-1	2009	Low-voltage switchgear and controlgear - Part 7-1: Ancillary equipment - Terminal blocks for copper conductors	EN 60947-7-1	2009
IEC 61010-1 + corr. May	2010 2011	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements	EN 61010-1	2010
IEC 61010-2-030	-	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-030: Particular requirements for testing and measuring circuits	EN 61010-2-030	-
IEC 61051-2	1991	Varistors for use in electronic equipment - Part 2: Sectional specification for surge suppression varistors	-	-

CONTENTS

INTRODUCTION

This IEC 61010-2-201 document constitutes Part 2-201 of a planned series of standards on industrial-process measurement, control and automation equipment.

This part specifies the complete safety requirements for control equipment (e.g. programmable controller (PLC)), the components of Distributed Control Systems, I/O devices, Human Machine Interface (HMI)).

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

This part incorporates the safety related requirements of Programmable Controllers.

Annex DD provides a cross reference between clauses of this standard and those of IEC 61010-1 or IEC 61131-2:2007.

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

Part 2-201: Particular requirements for control equipment

1 Scope and object

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

1.1.1 Equipment included in scope

Replacement:

This part of IEC 61010 specifies safety requirements and related verification tests for control equipment of the following types:

– Programmable controllers (PLC and PAC);
– the components of Distributed Control Systems (DCS);
– the components of remote I/O – systems;
– industrial PC (computers) and Programming and Debugging Tools (PADTs);
– Human-Machine Interfaces (HMI);
– any product performing the function of control equipment and/or their associated peripherals,

which have as their intended use the control and command of machines, automated manufacturing and industrial processes, e.g. discrete and continuous control.

Components of the above named equipment and in the scope of this standard are:

– (auxiliary) stand-alone power supplies;
– peripherals such as digital and analogue I/O, remote-I/O;
– industrial network equipment.

Control equipment and their associated peripherals are intended to be used in an industrial environment and may be provided as open or enclosed equipment.

NOTE 1 Control equipment intended also for use in other environments or for other purposes (example; for use in building installations to control light or other electrical installations, or for use on cars, trains or ships) can have additional conformity requirements defined by the safety standard(s) for these applications. These requirements can involve as example: insulation, spacings and power restrictions.

NOTE 2 Computing devices and similar equipment within the scope of IEC 60950 (planned to be replaced by IEC 62368) and conforming to its requirements are considered to be suitable for use with control equipment within the scope of this standard. However, some of the requirements of IEC 60950 for resistance to moisture and liquids are less stringent than those in IEC 61010-1:2010, 5.4.4 second paragraph.

Control equipment covered in this standard is intended for use in overvoltage category II (IEC 60664-1) in low-voltage installations, where the rated equipment supply voltage does not exceed a.c. 1 000 V r.m.s. (50/60 Hz), or d.c. 1 500 V.

NOTE 3 If equipment in the scope of this part is applied to overvoltage category III and IV installations, then the requirements of Annex K of Part 1 apply.

The requirements of ISO/IEC Guide 51 and IEC Guide 104, as they relate to this Part, are incorporated herein.

1.1.2 Equipment excluded from scope

Replacement:

This standard does not deal with aspects of the overall automated system, e.g. a complete assembly line. Control equipment (e.g. DCS and PLC), their application program and their associated peripherals are considered as components (components in this context are items which perform no useful function by themselves) of an overall automated system.

Since control equipment (e.g. DCS and PLC) are component devices, safety considerations for the overall automated system including installation and application are beyond the scope of this standard. Refer to IEC 60364 series of standards or applicable national/local regulations for electrical installation and guidelines.

1.2.1 Aspects included in scope

Replacement:

The purpose of the requirements of this standard is to ensure that all hazards to the operator, service personnel and the surrounding area are reduced to a tolerable level.

NOTE By using the terms "operator" and "service personnel" this standard considers the perception of hazards depending on training and skills. Annex AA gives a general approach in this regard.

Requirements for protection against particular types of hazard are given in Clauses 6 to 13, as follows:

a) electric shock or burn (see Clause 6);

b) mechanical hazards (see Clauses 7 and 8);

c) spread of fire from the control equipment (see Clause 9);

d) excessive temperature (see Clause 10);

e) effects of fluids and fluid pressure (see Clause 11);

f) effects of radiation, including lasers sources, and sonic and ultrasonic pressure (see Clause 12);

g) liberated gases, explosion and implosion (see Clause 13);

Requirements for protection against hazards arising from reasonably foreseeable misuse and ergonomic factors are specified in Clause 16.

Risk assessment for hazards or environments not fully covered above is specified in Clause 17.

NOTE Attention is drawn to the existence of additional requirements regarding the health and safety of labour forces.

1.2.2 Aspects excluded from scope

Replacement:

This standard does not cover:

a) reliability, functionality, performance, or other properties of the control equipment not related to safety;

b) mechanical or climatic requirements for operation, transport or storage;

c) EMC requirements (See e.g. IEC 61326 or IEC 61131-2);

d) protective measures for explosive atmospheres (See e.g. IEC 60079 series);

e) functional safety (See e.g. IEC 61508 or IEC 61131-6).

2 Normative references

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

Addition of the following references to the list:

IEC 60068-2-31:2008, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens*

IEC 60384-14:2005, *Fixed capacitors for use in electronic equipment – Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60695-2-11:2000, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products*

IEC 60947-5-1:2003, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

IEC 60947-7-1:2009*, Low-voltage switchgear and controlgear – Part 7-1: Ancillary equipment – Terminal blocks for copper conductors*

IEC 61010-1:2010, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*

IEC 61010-2-030, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-030: Particular requirements for testing and measuring circuits*

IEC 61051-2:1991, *Varistors for use in electronic equipment – Part 2: Sectional specification for surge suppression varistors*

Annex DD
(informative)

Cross references between IEC 61010-2-201 and IEC 61010-1:2010 or IEC 61131-2:2007

Table DD.1 – Cross-references between IEC 61010-2-201 and IEC 61010-1 or IEC 61131-2

These clauses and subclauses of IEC 61010-1 are addressed in IEC 61010-2-201	These clauses and subclauses of IEC 61131-2 are merged into IEC 61010-2-201	These clauses and subclauses of IEC 61131-2 are not merged into IEC 61010-2-201
1.1 Scope	1.1 Scope and object	
1.3 Verification	1.2 Compliance with this part	
1.4 Environmental conditions	1.3 Normative references	
2 Normative references	2 Type tests	
3 Terms and definitions	3 Terms and definitions	
4 Tests	4 Normal service conditions and requirements	
5 Marking and documentation		5 Functional requirements
6 Protection against electric shock	11 Safety requirements	6 Normal service and functional type tests and verifications
7 Protection against mechanical hazards	12 Safety type tests and verifications	7 General information to be provided by the manufacturer
8 Resistance to mechanical stresses	13 Safety routine tests	8 Electromagnetic compatibility (EMC) requirements
9 Protection against the spread of fire	14 Safety information to be provided by the manufacturer	9 Electromagnetic compatibility (EMC) type tests and verifications
10 Equipment temperature limits and resistance to heat		10 Electromagnetic compatibility (EMC) information to be provided by the manufacturer
11 Protection against hazards from fluids		
12 Protection against radiation, including laser sources, and against sonic and ultrasonic pressure		
13 Protection against liberated gases and substances, explosion and implosion		
14 Components and subassemblies		
15 Protection by interlocks		
16 Hazards resulting from application		
17 Risk assessment		
Annexes	Annexes	