

© Copyright SEK. Reproduction in any form without permission is prohibited.

## **Elektrisk utrustning för mätning, styrning och för laboratorieändamål – Säkerhet –**

### **Del 2-030: Särskilda fordringar på kretsar för mätning och provning**

*Safety requirements for electrical equipment for measurement, control and laboratory use –*

*Part 2-030: Particular requirements for testing and measuring circuits*

Som svensk standard gäller europastandarden EN 61010-2-030:2010. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61010-2-030:2010.

#### **Nationellt förord**

Europastandarden EN 61010-2-030:2010

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 61010-2-030, First edition, 2010 - Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-030: Particular requirements for testing and measuring circuits**

utarbetad inom International Electrotechnical Commission, IEC.

Standarden ska användas tillsammans med SS-EN 61010-1.

### *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.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

### *SEK är Sveriges röst i standardiseringsarbetet inom elområdet*

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

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.

### **SEK Svensk Elstandard**

Box 1284  
164 29 Kista  
Tel 08-444 14 00  
[www.elstandard.se](http://www.elstandard.se)

**Safety requirements for electrical equipment for measurement, control,  
and laboratory use -**

**Part 2-030: Particular requirements for testing and measuring circuits  
(IEC 61010-2-030:2010)**

Règles de sécurité pour appareils  
électriques de mesure, de régulation et  
de laboratoire -  
Partie 2-030: Exigences particulières pour  
les circuits de test et de mesure  
(CEI 61010-2-030:2010)

Sicherheitsbestimmungen für elektrische  
Mess-, Steuer-, Regel- und Laborgeräte -  
Teil 2-030: Besondere Bestimmungen für  
Prüf- und Messkreise  
(IEC 61010-2-030:2010)

This European Standard was approved by CENELEC on 2010-10-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard 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 European Standard 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, Croatia, 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

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 66/417/FDIS, future edition 1 of IEC 61010-2-030, prepared by IEC TC 66, Safety of measuring, control and laboratory equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61010-2-030 on 2010-10-01.

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

The following dates were fixed:

- latest date by which the EN has to be implemented  
at national level by publication of an identical  
national standard or by endorsement (dop) 2011-07-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2013-10-01

This Part 2-030 is to be used in conjunction with the latest edition of EN 61010-1, Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements. It was established on the basis of the 2010 edition of EN 61010-1. Amendments and revisions of Part 1 have also to be taken into account and the dates when such changes become applicable will be stated in the relevant amendment or revision of Part 1.

This Part 2-030 supplements or modifies the corresponding clauses in EN 61010-1 so as to convert it into the European Standard: *Particular requirements for testing and measuring circuits*.

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.

In the second edition of EN 61010-1, the requirements for testing and measuring circuits were included in Part 1 itself. In the third edition of EN 61010-1, these requirements have been removed from Part 1 and have become the basis for the requirements in this Part 2.

In addition to the requirements removed from Part 1, the following major requirements have been added to this standard. Numerous other changes have also been made.

- The terminology for MEASUREMENT CATEGORY I has changed. In this Part 2, it is termed “not rated for measurements within MEASUREMENT CATEGORIES II, III, or IV”.
- CLEARANCES and CREEPAGE DISTANCES have been added for unmated measuring circuit TERMINALS.
- Requirements have been added for specialized measuring circuit TERMINALS.
- Requirements for TRANSIENT OVERVOLTAGE limiting devices have been revised.
- Requirements have been revised and added pertaining to REASONABLY FORESEEABLE MISUSE of measuring circuits, including disconnection of the protective earth and usage of the equipment in a manner that might cause arc flash.
- Insulation requirements for measuring circuits have been primarily located in Annex K.
- Annex AA has been added to describe the characteristics of MEASUREMENT CATEGORIES.
- Annex BB has been added to describe hazards that may be encountered when using measuring circuits.

NOTE 1 The following print types are used:

- requirements: in roman type;

- *conformity and test: in italic type;*
- NOTES: in small roman type;
- terms used throughout this standard which have been defined in Clause 3: SMALL ROMAN CAPITALS;

NOTE 2 Subclauses, figures, tables and notes which are additional to those in Part 1 are numbered starting from 101. Additional Annexes are numbered AA and BB.

Annex ZA of Part 1 is applicable.

---

### **Endorsement notice**

The text of the International Standard IEC 61010-2-030:2010 was approved by CENELEC as a European Standard without any modification.

---

### **Bibliography**

*Add* the following reference to the Bibliography of Part 1:

EN 41003:1999

IEC 61010-2-032

NOTE Harmonized as EN 61010-2-032

## CONTENTS

1	Scope and object .....	7
2	Normative references.....	7
3	Terms and definitions .....	7
4	Tests .....	8
5	Marking and documentation .....	8
6	Protection against electric shock.....	9
7	Protection against mechanical HAZARDS .....	12
8	Resistance to mechanical stresses .....	12
9	Protection against the spread of fire .....	12
10	Equipment temperature limits and resistance to heat .....	12
11	Protection against HAZARDS from fluids .....	12
12	Protection against radiation, including laser sources, and against sonic and ultrasonic pressure .....	12
13	Protection against liberated gases and substances, explosion and implosion.....	12
14	Components and subassemblies.....	12
15	Protection by interlocks .....	13
16	HAZARDS resulting from application .....	13
17	RISK assessment.....	13
101	Measuring circuits.....	13
	Annexes .....	18
	Annex K (normative) Insulation requirements not covered by 6.7 .....	18
	Annex L (informative) Index of defined terms .....	24
	Annex AA (normative) Measurement categories.....	25
	Annex BB (informative) Hazards pertaining to measurements performed in certain environments .....	28
	Bibliography.....	31
	Figure AA.1 – Example to identify the locations of measuring circuits .....	26
	Table 101 – CLEARANCES and CREEPAGE DISTANCES for measuring circuit TERMINALS with HAZARDOUS LIVE conductive parts .....	11
	Table 102 – Impulse withstand voltages.....	13
	Table K.101 – CLEARANCES for MEASUREMENT CATEGORIES II, III and IV .....	19
	Table K.102 – Test voltages for testing electric strength of solid insulation in measuring circuits of MEASUREMENT CATEGORY II .....	20
	Table K.103 – Test voltages for solid insulation in measuring circuits of MEASUREMENT CATEGORY III .....	20
	Table K.104 – Test voltages for testing electric strength of solid insulation in measuring circuits of MEASUREMENT CATEGORY IV .....	20
	Table K.105 – Test voltages for testing long term stress of solid insulation in measuring circuits.....	21
	Table K.106 – Maximum TRANSIENT OVERVOLTAGES .....	23

Table AA.1 – Characteristics of MEASUREMENT CATEGORIES .....	27
--	----

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

### **Part 2-030: Particular requirements for testing and measuring circuits**

#### **1 Scope and object**

This clause of Part 1 is applicable except as follows:

##### **1.1.1 Equipment included in scope**

*Replace the text with the following:*

This part of IEC 61010 specifies safety requirements for testing and measuring circuits which are connected for test or measurement purposes to devices or circuits outside the measurement equipment itself.

These include measurement circuits which are part of electrical test and measurement equipment, laboratory equipment, or process control equipment. The existence of these circuits in equipment requires additional protective means between the circuit and an OPERATOR.

NOTE 1 These testing and measuring circuits may, for example:

- measure voltages in circuits of other equipment,
- measure temperature of a separate device via a thermocouple,
- measure force on a separate device via a strain gauge,
- inject a voltage onto a circuit to analyze a new design.

NOTE 2 Testing and measuring circuits that are not within the scope of this Part 2 are considered to be covered by the requirements of Part 1.

NOTE 3 Equipment containing these testing and measuring circuits may be intended for performing tests and measurements on hazardous conductors, including MAINS conductors and telecommunication network conductors. See Annex BB for considerations of HAZARDS involved in various tests and measurements.

#### **2 Normative references**

This clause of Part 1 is applicable.