

**SLOVENSKI STANDARD**  
**SIST EN 61010-2-012:2017**  
**01-junij-2017**

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**Varnostne zahteve za električno opremo za meritve, nadzor in laboratorijsko uporabo - 2-012. del: Posebne zahteve za opremo za klimatska in okoljska preskušanja ter drugo opremo za uravnavanje temperature (IEC 61010-2-012:2016)**

Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-012: Particular requirements for climatic and environmental testing and other temperature conditioning equipment (IEC 61010-2-012:2016)

**iTeh STANDARD PREVIEW**  
Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte - Teil 2 -012: Besondere Anforderungen an Klima- und Umwelttestgeräte und andere Temperatur-Konditionierungsgeräte (IEC 61010-2-012:2016)

[SIST EN 61010-2-012:2017](https://standards.itih.ai/catalog/standards/sist/66616f4c-84f8-49c6-b6ca-70e0c0e10000/sist-en-61010-2-012-2017)

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Règles de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire - Partie 2-012: Exigences particulières pour appareils d'essais climatiques et d'environnement, et autres appareils de conditionnement de température

**Ta slovenski standard je istoveten z: EN 61010-2-012:2016**

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**ICS:**

19.040	Preskušanje v zvezi z okoljem	Environmental testing
19.080	Električno in elektronsko preskušanje	Electrical and electronic testing
71.040.10	Kemijski laboratoriji. Laboratorijska oprema	Chemical laboratories. Laboratory equipment

**SIST EN 61010-2-012:2017**

**en,fr,de**

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EUROPEAN STANDARD

**EN 61010-2-012**

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2016

ICS 19.080

English Version

**Safety requirements for electrical equipment for measurement,  
control and laboratory use - Part 2-012: Particular requirements  
for climatic and environmental testing and other temperature  
conditioning equipment  
(IEC 61010-2-012:2016)**

Règles de sécurité pour appareils électriques de mesurage,  
de régulation et de laboratoire - Partie 2-012: Exigences  
particulières pour les appareils d'essais climatiques et  
d'environnement, et autres appareils de conditionnement de  
température  
(IEC 61010-2-012:2016)

Sicherheitsbestimmungen für elektrische Mess-, Steuer-,  
Regel- und Laborgeräte - Teil 2-012: Besondere  
Anforderungen an Klima- und Umwelttestgeräte und andere  
Temperatur-Konditionierungsgeräte  
(IEC 61010-2-012:2016)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

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

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

**EN 61010-2-012:2016****European foreword**

The text of document 66/590/FDIS, future edition 1 of IEC 61010-2-012, prepared by IEC/TC 66 "Safety of measuring, control and laboratory equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61010-2-012:2016.

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) 2017-05-16
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-08-19

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.

**Endorsement notice**

The text of the International Standard IEC 61010-2-012:2016 was approved by CENELEC as a European Standard without any modification.

The Bibliography of EN 61010-1:2010 is applicable except as follows:

In the bibliography of EN 61010-1:2010, the following notes have to be **added** for the standards indicated:

IEC 60068-1:1988+A1:1992	NOTE	Harmonized as EN 60068-1:1994 <sup>1)</sup> (not modified).
IEC 60068-2-1:2007	NOTE	Harmonized as EN 60068-2-1:2007 (not modified).
IEC 60068-2-2:2007	NOTE	Harmonized as EN 60068-2-2:2007 (not modified).
IEC 60068-2-5:2010	NOTE	Harmonized as EN 60068-2-5:2011 (not modified).
IEC 60068-2-10:2005	NOTE	Harmonized as EN 60068-2-10:2005 (not modified).
IEC 60068-2-11:1981	NOTE	Harmonized as EN 60068-2-11:1999 (not modified).
IEC 60068-2-13:1983	NOTE	Harmonized as EN 60068-2-13:1999 (not modified).
IEC 60068-2-14:2009	NOTE	Harmonized as EN 60068-2-14:2009 (not modified).
IEC 60068-2-30:2005	NOTE	Harmonized as EN 60068-2-30:2005 (not modified).
IEC 60068-2-38:2009	NOTE	Harmonized as EN 60068-2-38:2009 (not modified).
IEC 60068-2-39:1976	NOTE	Harmonized as EN 60068-2-39:1999 <sup>2)</sup> (not modified).
IEC 60068-2-40:1976+A1:1983	NOTE	Harmonized as EN 60068-2-40:1999 (not modified).
IEC 60068-2-41:1976+A1:1983	NOTE	Harmonized as EN 60068-2-41:1999 (not modified).
IEC 60068-2-53:2010	NOTE	Harmonized as EN 60068-2-53:2010 (not modified).
IEC 60068-2-66:1994	NOTE	Harmonized as EN 60068-2-66:1994 (not modified).
IEC 60068-2-67:1995	NOTE	Harmonized as EN 60068-2-67:1996 (not modified).
IEC 60068-2-78:2001	NOTE	Harmonized as EN 60068-2-78:2001 <sup>3)</sup> (not modified).
IEC 60068-3-5	NOTE	Harmonized as EN 60068-3-5.
IEC 60335-2-41	NOTE	Harmonized as EN 60335-2-41.

<sup>1)</sup> Superseded by EN 60068-1:2014 (IEC 60068-1:2013).

<sup>2)</sup> Superseded by EN 60068-2-39:2016 (IEC 60068-2-39:2015).

<sup>3)</sup> Superseded by EN 60068-2-78:2013 (IEC 60068-2-78:2012).

IEC 60335-2-73:2002	NOTE	Harmonized as EN 60335-2-73:2003 (modified).
IEC 60335-2-73:2002/A1:2006	NOTE	Harmonized as EN 60335-2-73:2003/A1:2006 (not modified).
IEC 60335-2-74:2002	NOTE	Harmonized as EN 60335-2-74:2003 (not modified).
IEC 60335-2-74:2002/A1:2006	NOTE	Harmonized as EN 60335-2-74:2003/A1:2006 (not modified).
IEC 60335-2-89	NOTE	Harmonized as EN 60335-2-89.
IEC 60335-2-98:2002	NOTE	Harmonized as EN 60335-2-98:2003 (not modified).
IEC 60335-2-98:2002/A1:2004	NOTE	Harmonized as EN 60335-2-98:2003/A1:2005 (not modified).
IEC 61010-2-010	NOTE	Harmonized as EN 61010-2-010.
IEC 61770:2008	NOTE	Harmonized as EN 61770:2009 (not modified).
ISO 4126-1	NOTE	Harmonized as EN ISO 4126-1.
ISO 9227	NOTE	Harmonized as EN ISO 9227.

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## 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 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu)

**Annex ZA of EN 61010-1:2010 is applicable, except as follows:**

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
<b>Additions:</b>				
IEC 60079-15	2010	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"	EN 60079-15	2010
IEC 60079-20-1	-	Explosive atmospheres Part 20-1: Material characteristics for gas and vapour classification - Test methods and data	EN 60079-20-1	-
IEC 60335-2-24	2010	Household and similar electrical appliances - Safety - Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice makers	EN 60335-2-24	2010
+A1 (mod)	2012		+A1	2016
IEC 60335-2-34	2012	Household and similar electrical appliances - Safety - Part 2-34: Particular requirements for motor- compressors	EN 60335-2-34	2013
+A1	2015		+A1	2015
IEC 62471	-	Photobiological safety of lamps and lamp systems	EN 62471	-
IEC/TR 62471-2	-	Photobiological safety of lamps and lamp systems - Part 2: Guidance on manufacturing requirements relating to non-laser optical radiation safety	-	-
ISO 7010	2011	Graphical symbols - Safety colours and safety signs - Registered safety signs	EN ISO 7010	2012



IEC 61010-2-012

Edition 1.0 2016-07

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



GROUP SAFETY PUBLICATION  
PUBLICATION GROUPEE DE SÉCURITÉ

**Safety requirements for electrical equipment for measurement, control and laboratory use –  
Part 2-012: Particular requirements for climatic and environmental testing and other temperature conditioning equipment**

<https://standards.iteh.ai/catalog/standards/sist/66616f4c-84f8-49c6-b6ca-30b9e3141cc1/iec-61010-2-012>

**Règles de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire –  
Partie 2-012: Exigences particulières pour les appareils d'essais climatiques et d'environnement, et autres appareils de conditionnement de température**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

### Part 2-012: Particular requirements for climatic and environmental testing and other temperature conditioning equipment

#### 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.
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International Standard IEC 61010-2-012 has been prepared by IEC technical committee 66: Safety of measuring, control and laboratory equipment.

It has the status of a group safety publication in accordance with IEC Guide 104.

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

FDIS	Report on voting
66/590/FDIS	66/599/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.

A list of all parts of the IEC 61010 series, under the general title, *Safety requirements for electrical equipment for measurement, control, and laboratory use*, may be found on the IEC website.

IEC 61010-2-012 is to be used in conjunction with the latest edition of IEC 61010-1. It was established on the basis of the third edition (2010) of IEC 61010-1

This Part 2-012 supplements or modifies the corresponding clauses in IEC 61010-1 so as to convert that publication into the IEC standard: *Particular requirements for climatic and environmental testing and other temperature conditioning 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.

In this standard:

- 1) the following print types are used:
  - requirements and definitions: in roman type;
  - NOTES: in smaller roman type;
  - *conformity and tests: in italic type*;
  - terms used throughout this standard which have been defined in Clause 3: SMALL ROMAN CAPITALS.
- 2) subclauses, figures, tables and notes which are additional to those in Part 1 are numbered starting from 101. Additional annexes are lettered starting from AA.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

## INTRODUCTION

This standard, in conjunction with Part 2-010 and Part 2-011, addresses the specific HAZARDS associated with the heating and cooling of materials by equipment and are segregated as follows:

IEC 61010-2-010	specifically addresses the HAZARDS associated with equipment incorporating heating systems.
IEC 61010-2-011	specifically addresses the HAZARDS associated with equipment incorporating REFRIGERATING SYSTEMS.
IEC 61010-2-012	specifically addresses the HAZARDS associated with equipment incorporating both heating and REFRIGERATING SYSTEMS that interact with each other such that the combined heating and cooling system yield additional or more severe HAZARDS for the two systems than if treated separately. It also addresses the HAZARDS associated with the treatment of materials by other factors like irradiation, excessive humidity, CO <sub>2</sub> and MECHANICAL MOVEMENT etc.

### Guidance for the application of the appropriate Part 2 standard(s)

When the equipment includes only a material heating system, and no REFRIGERATING SYSTEM or other environmental factors apply, then Part 2-010 applies without needing Part 2-011 or Part 2-012. Similarly, when the equipment includes only a REFRIGERATING SYSTEM, and no material heating system or other environmental factors apply, then Part 2-011 applies without needing Part 2-010 or Part 2-012. However, when the equipment incorporates both a material heating system, and a REFRIGERATING SYSTEM or the materials being treated in the intended application introduce significant heat into the REFRIGERATING SYSTEM, a determination should be made whether the interaction between the two systems will generate additional or more severe HAZARDS than if the systems were evaluated separately (application temperature, see flow chart for selection process). If the interaction of the heating and cooling functions yields no additional or more severe HAZARDS then both Part 2-010 and Part 2-011 apply for their respective functions. Conversely, if additional or more severe HAZARDS result from the combining of the heating and cooling function, or the equipment incorporates additional material treatment factors then Part 2-012 applies but not Part 2-010 or Part 2-011.

### What HAZARDS are applicable for a REFRIGERATING SYSTEM?

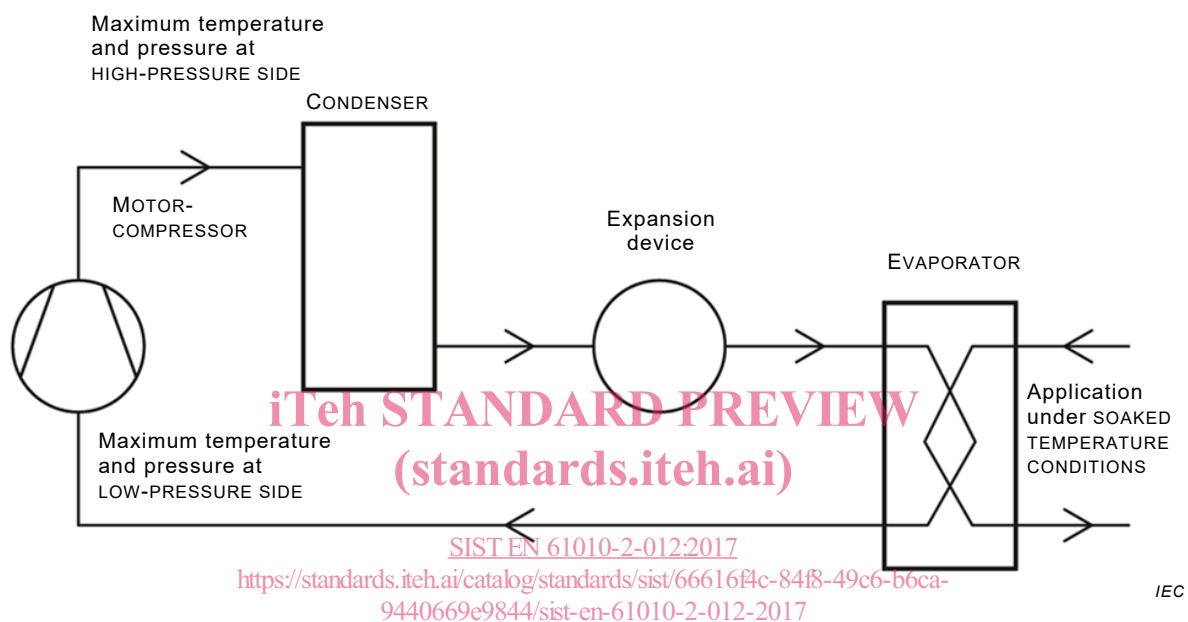
The typical HAZARDS for a REFRIGERATING SYSTEM (see Figure 101) consisting of a MOTOR-COMPRESSOR, a CONDENSER, an expansion device and an EVAPORATOR include but are not limited to:

- The maximum temperature of LOW-PRESSURE SIDE (return temperature) to the MOTOR-COMPRESSOR. A MOTOR-COMPRESSOR incorporates a REFRIGERANT cooled motor and it should be established that the maximum temperatures of LOW-PRESSURE SIDE under least favourable condition do not exceed the insulation RATINGS within the motor.
- The maximum pressure of LOW-PRESSURE SIDE at the inlet to the MOTOR-COMPRESSOR. The housing of the MOTOR-COMPRESSOR is exposed to this pressure and so the design RATING of the MOTOR-COMPRESSOR housing should accommodate the worst case pressures whilst providing the correct safety margin for a pressure vessel.
- The maximum temperature of HIGH-PRESSURE SIDE to the CONDENSER. The temperatures of HIGH-PRESSURE SIDE under most unfavourable conditions may present a temperature HAZARD if the OPERATOR is exposed to or electrical insulation is degraded.
- The maximum pressure of HIGH-PRESSURE SIDE at the outlet to the MOTOR-COMPRESSOR. The REFRIGERANT components downstream of the MOTOR-COMPRESSOR up to the expansion device are exposed to this pressure and so the design RATING of these components should accommodate the worst case pressures whilst providing the appropriate safety margin for a pressure vessel.
- The maximum application temperatures, namely, the SOAKED TEMPERATURE CONDITIONS, where the heat is being extracted from, may impact the maximum temperature of LOW-PRESSURE SIDE to the MOTOR-COMPRESSOR as well as present a temperature HAZARD if the

OPERATOR is exposed to or electrical insulation is degraded. Whether this application temperature is derived from an integral heating function of the device or from the heat dissipated from the material being cooled the impact under worst case conditions should be evaluated.

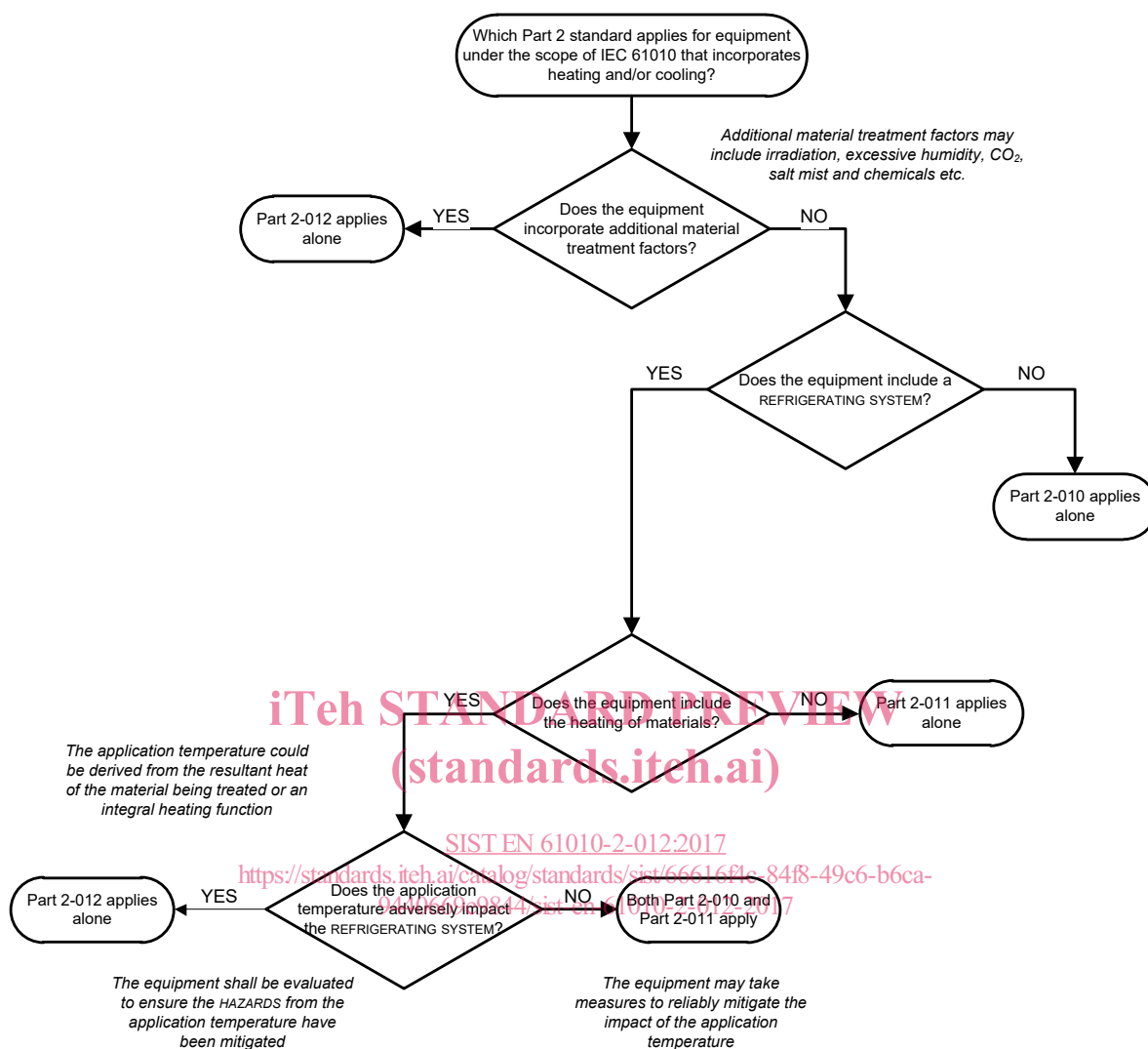
- The current draw of the equipment should be established when including the worst case running conditions of the REFRIGERATING SYSTEM including any defrost cycles that may apply.

The worst case conditions should be determined for the equipment and will include both the least favourable NORMAL USE conditions as well as the most unfavourable testing results under SINGLE FAULT CONDITIONS.



**Figure 101 – Schema of a REFRIGERATING SYSTEM incorporating a CONDENSER**

The selection process is illustrated in the following flow chart (see Figure 102).



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

### Part 2-012: Particular requirements for climatic and environmental testing and other temperature conditioning equipment

#### 1 Scope and object

This clause of Part 1 is applicable except as follows:

##### 1.1.1 Equipment included in scope

*Replacement:*

*Replace the first paragraph by the following:*

This group safety publication is primarily intended to be used as a product safety standard for the products mentioned in the scope, but shall also be used by technical committees in the preparation of their publications for products similar to those mentioned in the scope of this standard, in accordance with the principles laid down in IEC Guide 104 and ISO/IEC Guide 51.

This Part 2 of IEC 61010 specifies safety requirements for electrical equipment and their accessories within the categories a) through c), wherever they are intended to be used, whenever that equipment incorporates one or more of the following characteristics:

- A REFRIGERATING SYSTEM that is acted on or impacted by an integral heating function such that the combined heating and cooling system generates additional and/or more severe HAZARDS than those for the two systems if treated separately.
- The materials being treated in the intended application introduce significant heat into the REFRIGERATING SYSTEM that the cooling system in the application yield additional and/or more severe HAZARDS than those for the cooling system if operated at the maximum RATED ambient alone.
- An irradiation function for the materials being treated presenting additional HAZARDS.
- A function to expose the materials being treated to excessive humidity, carbon dioxide, salt mist, or other substances which may result in additional HAZARDS.
- A function of MECHANICAL MOVEMENT presenting additional HAZARDS.
- Provision for an OPERATOR to walk-in to the operating area to load or unload the materials being treated.

*Addition:*

*Add the following text after the last paragraph:*

NOTE 101 Examples of such equipment include environmental testing and plant growth TEST CHAMBERS, refrigerating CIRCULATORS which incorporate heating, recirculating coolers for extracting heat.

If all or part of the equipment falls within the scope of one or more other Part 2 standards of IEC 61010 as well as within the scope of this standard, it should also meet the requirements of those other Part 2 standards. However, when the equipment incorporates only a REFRIGERATING SYSTEM or only a heating function or a combination of the two without introducing additional HAZARDS described in the above dashed paragraphs then the application of IEC 61010-2-011 or IEC 61010-2-010 or both, as applicable, shall be considered instead of this Part 2.