

INTERNATIONAL STANDARD

NORME INTERNATIONALE



GROUP SAFETY PUBLICATION
PUBLICATION GROUPEE DE SÉCURITÉ

**Safety requirements for electrical equipment for measurement, control and laboratory use –
Part 2-010: Particular requirements for laboratory equipment for the heating of materials**

<https://standards.iteh.ai/catalog/standards/sist/65474fd2-509a-411a-84f7-100000000000/iec-61010-2-010:2019>

Exigences de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire –

Partie 2-010: Exigences particulières pour appareils de laboratoire utilisés pour l'échauffement des matières



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2019 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22,000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

67,000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

67 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

INTERNATIONAL STANDARD

NORME INTERNATIONALE



GROUP SAFETY PUBLICATION
PUBLICATION GROUPEE DE SÉCURITÉ

**Safety requirements for electrical equipment for measurement, control and laboratory use –
Part 2-010: Particular requirements for laboratory equipment for the heating of materials**

<https://standards.iteh.ai/catalog/standards/sist/65474fd2-509a-411a-84f7-7738-5b7615cc0d76/iec-61010-2-010:2019>

**Exigences de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire –
Partie 2-010: Exigences particulières pour appareils de laboratoire utilisés pour l'échauffement des matières**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 19.080; 71.040.20

ISBN 978-2-8322-6502-4

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	6
1 Scope and object.....	9
2 Normative references	9
3 Terms and definitions	10
4 Tests	10
5 Marking and documentation.....	10
6 Protection against electric shock	14
7 Protection against mechanical HAZARDS.....	16
8 Resistance to mechanical stresses	16
9 Protection against the spread of fire	17
10 Equipment temperature limits and resistance to heat.....	18
11 Protection against HAZARDS from fluids and solid foreign objects	19
12 Protection against radiation, including laser sources, and against sonic and ultrasonic pressure	20
13 Protection against liberated gases and substances, explosion and implosion	20
14 Components and subassemblies	21
15 Protection by interlocks	22
16 HAZARDS resulting from application	22
17 RISK assessment	22
Annexes	23
Annex K (normative) Insulation requirements not covered by 6.7	24
Bibliography.....	25
Figure 101 – Schema of a refrigerating system incorporating a condenser.....	7
Figure 102 – Flow chart illustrating the selection process	8
Table 1 – Symbols	10
Table 101 – Time-temperature conditions	20

ITeH STANDARD PREVIEW

(standards.iteh.ai)

IEC 61010-2-010:2019

[https://standards.iteh.ai/catalog/standards/sist/65474fd2-509a-411a-84f7-](https://standards.iteh.ai/catalog/standards/sist/65474fd2-509a-411a-84f7-8771bc5b68de/iec-61010-2-010-2019)

[8771bc5b68de/iec-61010-2-010-2019](https://standards.iteh.ai/catalog/standards/sist/65474fd2-509a-411a-84f7-8771bc5b68de/iec-61010-2-010-2019)

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SAFETY REQUIREMENTS FOR ELECTRICAL EQUIPMENT
FOR MEASUREMENT, CONTROL AND LABORATORY USE –****Part 2-010: Particular requirements for laboratory
equipment for the heating of materials**

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 61010-2-010 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.

This fourth edition cancels and replaces the third edition published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) alignment with changes introduced by Amendment 1 of IEC 61010-1:2010;
- b) alignment with IEC 61010-2-011 and IEC 61010-2-012:

- new matching Introduction clarifying which standard(s) to use;
 - new 5.4.101 instructions for flammable liquid HEAT TRANSFER MEDIUM;
 - subclause 9.5 on flammable liquids replaced with text from IEC 61010-2-012;
- c) subclause 5.2.101 deleted;
- d) requirements in 10.101 b) and c) clarified.

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

CDV	Report on voting
66/657/CDV	66/678/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

This Part 2-010 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) and its Amendment 1 (2016), hereinafter referred to as Part 1.

This Part 2-010 supplements or modifies the corresponding clauses in IEC 61010-1 so as to convert that publication into the IEC standard: *Particular requirements for laboratory equipment for the heating of materials*.

Where a particular subclause of Part 1 is not mentioned in this Part 2-010, that subclause applies as far as is reasonable. Where this Part 2-010 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: in roman type;
 - NOTES in small roman type;
 - *conformity and test: 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 document 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 document. At this date, the document 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.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[IEC 61010-2-010:2019](#)

<https://standards.iteh.ai/catalog/standards/sist/65474fd2-509a-411a-84f7-877fbc5b68de/iec-61010-2-010-2019>

INTRODUCTION

This Part 2-010, Part 2-011 and Part 2-012, taken together, address the specific HAZARDS associated with the heating and cooling of materials by equipment and are organized 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 ₂ 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 as to whether the interaction between the two systems will generate additional or more severe HAZARDS than if the systems were evaluated separately (controlled temperature, see flow chart of Figure 102 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 functions, or if 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 must 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 must 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 the high-pressure side under most unfavourable conditions may present a temperature HAZARD if the OPERATOR is exposed to them or if the 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 must accommodate the worst-case pressures whilst providing the appropriate safety margin for a pressure vessel.
- The maximum controlled 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 them or if the electrical insulation is degraded. Whether this controlled 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 need to 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.

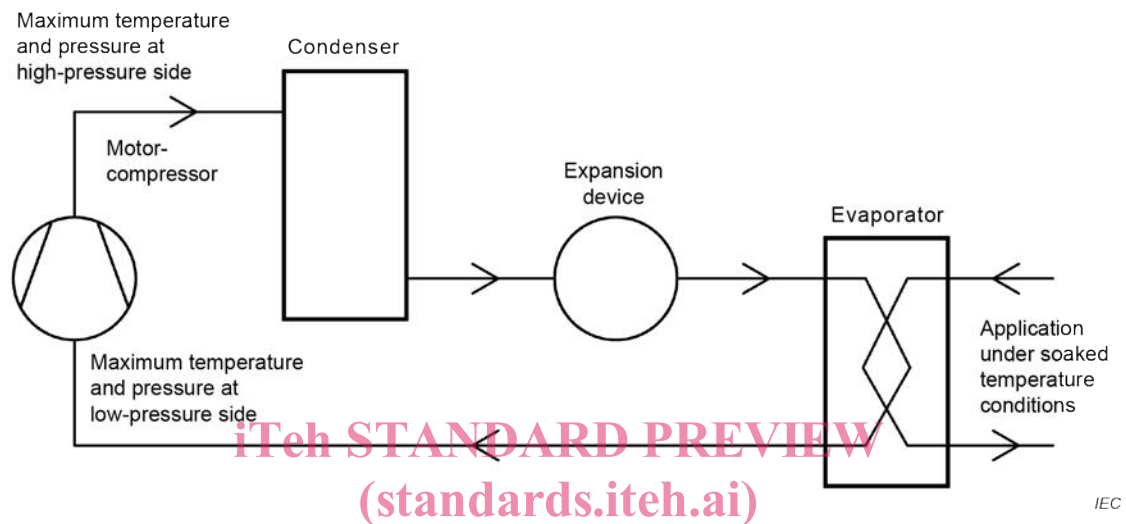


Figure 101 – Schema of a refrigerating system incorporating a condenser

<https://standards.iteh.ai/catalog/standards/sist/65474fd2-509a-411a-84f7-877fbc5b68de/iec-61010-2-010-2019>

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

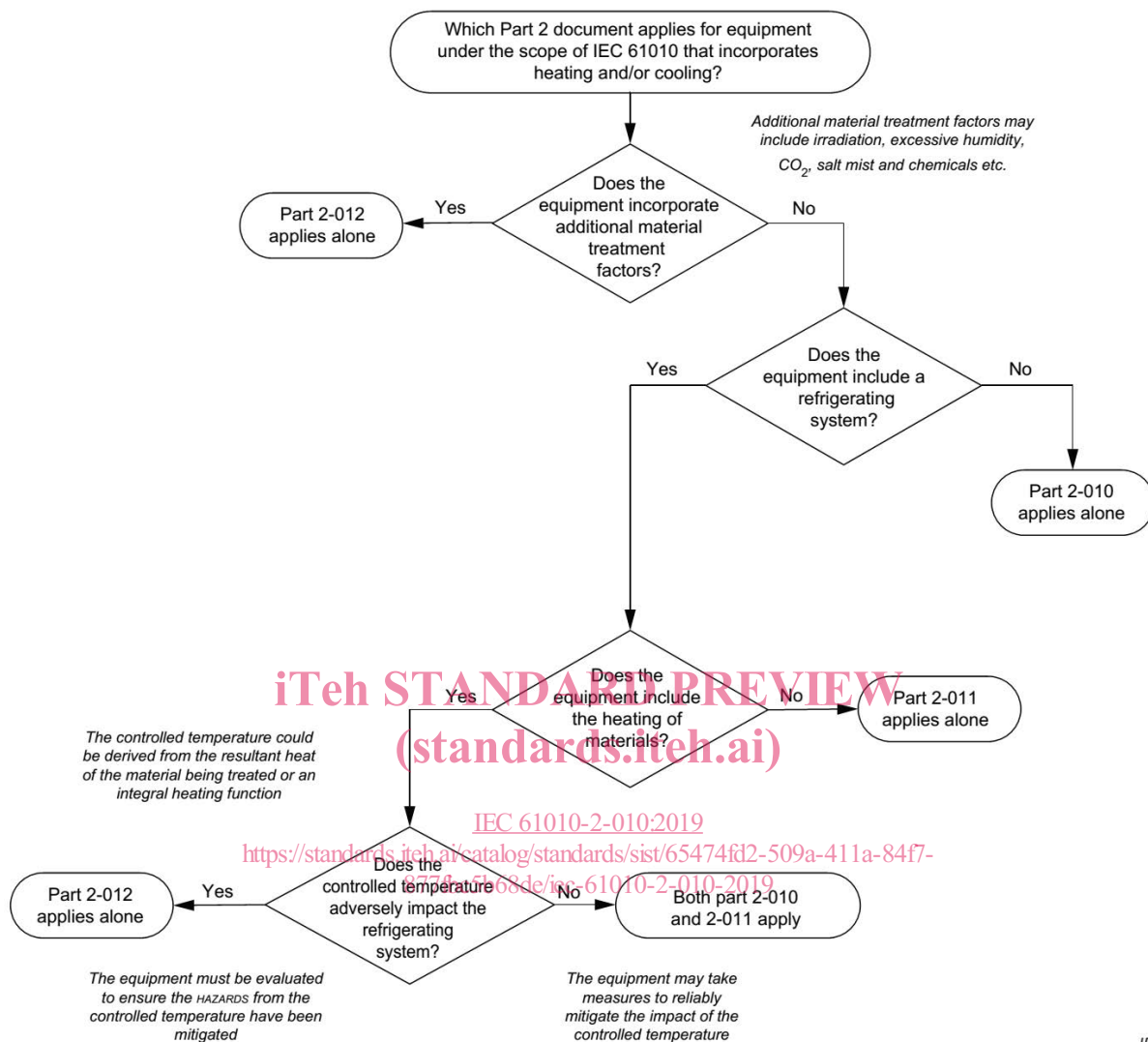


Figure 102 – Flow chart illustrating the selection process

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

Part 2-010: Particular requirements for laboratory equipment for the heating of materials

1 Scope and object

This clause of Part 1 is applicable except as follows:

1.1.1 Equipment included in scope

Replacement:

Replace the second paragraph by the following:

This part of IEC 61010 specifies particular safety requirements for the following types a) to c) of electrical equipment and their accessories, wherever they are intended to be used, whenever the heating of materials is one of the functions of the equipment.

Addition:

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Add the following text after item c):

It is possible that 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. In that case, the requirements of those other Part 2 standards will also apply. In particular, if equipment is intended to be used for in vitro diagnostic (IVD) purposes, the requirements of IEC 61010-2-101 will also apply. However, when the equipment incorporates a refrigerating system and a heating function where the combination of the two introduces additional or more severe HAZARDS than if treated separately, then it is possible that IEC 61010-2-012 is applicable instead of this Part 2-010.

See further information in the flow chart (Figure 102) for the selection process and the guidance in the Introduction.

1.1.2 Equipment excluded from scope

Addition:

Add the following items after item j):

- aa) equipment for the heating and ventilation of laboratories;
- bb) sterilizing equipment;
- cc) heating and/or cooling equipment which the OPERATOR is intended to enter, and which is large enough for the OPERATOR to remain inside with the door or doors closed.

2 Normative references

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

Addition:

Add the following reference to the list:

ISO 7010, *Graphical symbols – Safety colours and safety signs – Registered safety signs* (available at <https://www.iso.org/obp>)

3 Terms and definitions

This clause of Part 1 is applicable except as follows:

3.2 Parts and accessories

Addition:

Add the following new term and definition:

3.2.101

HEAT TRANSFER MEDIUM

medium used to transfer heat to the material being processed

4 Tests

This clause of Part 1 is applicable except as follows:

4.4.2.11 Heating devices

Addition:

Add the following new text after the existing text:

[IEC 61010-2-010:2019](https://standards.iteh.ai/standards/iec/61010-2-010:2019)

If a HAZARD could be caused by over-filling or under-filling with a liquid HEAT TRANSFER MEDIUM, the equipment shall be tested when it is empty, partially filled, or overfilled, whichever is least favourable. In case of doubt, the test shall be carried out in more than one condition. The HEAT TRANSFER MEDIUM used for the test shall be of a type specified for NORMAL USE.

5 Marking and documentation

This clause of Part 1 is applicable except as follows:

5.1.3 MAINS supply

Addition:


Add the following new text to the end of item c):

If, for periods of 1 min or less after switching on, the actual power or current can be much higher than the marked maximum RATED power or current, the short-term maximum may be marked in brackets after the maximum RATED power or current.

Table 1 – Symbols

Addition:

Add the following new symbol to Table 1:

Number	Symbol	Publication	Description
101	 <p>Background colour – yellow (optional, not green); symbol and outline – black (optional).</p>	ISO 7010-W021:2011-05	Warning; Flammable material

5.1.6 Switches and circuit-breakers

Addition:

Add the following new text after the last paragraph, before the conformity statement:

For ovens and similar equipment, there shall be an indication of the "ON" condition on each side of the equipment which has a door in it or has any other opening intended for loading material.

5.4.3 Equipment installation

Replacement:

Replace the text with the following new text:

The documentation shall include installation and specific commissioning instructions and, if necessary for safety, warnings against HAZARDS which could arise during installation or commissioning or as a result of improper installation or commissioning of the equipment. Such information includes, if applicable:

- a) assembly, location and mounting requirements. If a HAZARD could be caused by hot items falling from the equipment, for example when a door is opened, there shall be a warning that the equipment shall not be mounted on a surface of flammable material;
- b) instructions for protective earthing;
- c) connections to the supply, and for equipment in which HAZARDOUS LIVE parts may need to be ACCESSIBLE (see 6.1.2), a statement requiring the fitting of a residual current-operated circuit-breaker;
- d) for PERMANENTLY CONNECTED EQUIPMENT:
 - 1) supply wiring requirements;
 - 2) requirements for any external switch or circuit-breaker (see 6.11.3.1) and external overcurrent protection devices (see 9.6.2), and a recommendation that the switch or circuit-breaker be near the equipment;
- e) ventilation requirements;
- f) requirements and safety characteristics for special external services, for example: maximum and minimum temperatures, pressure, or flow of air or cooling liquid.
- g) the maximum sound level produced by equipment which emits sound, if measurement is required by 12.5.1;
- h) instructions relating to sound level (see 12.5.1);
- i) any requirement for drying-out (see 5.4.3.101);
- j) if the heating of materials could lead to liberation of hazardous substances: installation instructions shall warn of any need for an extraction system, additional temperature-limiting devices relating to safe temperatures for the materials, or other necessary measures (see also Note 2 to 5.4.1).

NOTE An extraction system is a system which removes air from the building, not a recirculating system.

It is recommended to add a statement in the documentation for the installation that the safety of any system incorporating the equipment is the responsibility of the assembler of the system.

Conformity is checked by inspection.

Addition:

Add the following new subclause:

5.4.3.101 Drying-out

If, after transport or storage in humid conditions, equipment could fail to meet all the safety requirements of this document, the installation instructions shall specify a period of operation to dry out the equipment and restore it to NORMAL CONDITION. The instructions shall include a warning that the equipment cannot be assumed to meet all the safety requirements of this document during the drying-out process.

Conformity is checked by inspection.

5.4.4 Equipment operation

Addition:

Add the following at the end of item g):

(see 5.4.4.101);

Add the following after item j):

- aa) specification of additional protection needed by the OPERATOR when HAZARDOUS LIVE parts are permitted to be ACCESSIBLE (see 6.1.2.101);
- bb) a warning about any possible HAZARDS of explosion, implosion, or the release of toxic or flammable gases arising from the materials being heated (see also 5.4.4 h));
- cc) specification of HEAT TRANSFER MEDIA which are suitable for use, for example liquids for use in a heating bath;
- dd) specific requirements for ventilation.

Addition:

Add the following new subclause:

5.4.4.101 Cleaning and decontamination

The instructions shall include recommendations for cleaning and, where necessary, decontamination, together with the recognized generic names of recommended materials for cleaning and decontamination, and an indication of any materials which could be likely to be used but which are incompatible with parts of the equipment or with material contained in it.

The instructions shall also state that the RESPONSIBLE BODY shall ensure that:

- a) appropriate decontamination is carried out if hazardous material is spilled onto or into the equipment;
- b) no decontamination or cleaning agents are used which could cause a HAZARD as a result of a reaction with parts of the equipment or with material contained in it;
- c) the manufacturer or its agent is consulted if there is any doubt about the compatibility of decontamination or cleaning agents with parts of the equipment or with material contained in it.

Manufacturers should be aware of the internationally recognized "Laboratory Biosafety Manual", published by the World Health Organization in Geneva, which gives information on decontaminants, their use, dilutions, properties and potential applications. There are also national guidelines which cover these areas.

Cleaning and decontamination may be necessary as a safeguard when laboratory heating equipment and any accessories are maintained, repaired, or transferred. Manufacturers should provide a document for the RESPONSIBLE BODY to certify that such treatment has been carried out.

Conformity is checked by inspection.

5.4.5 Equipment maintenance and service

Addition:

Add the following new text:

If a high-temperature cable or other special cable is used for the MAINS supply cord, the instructions shall state that it is to be replaced by an equivalent cable only.

If practicable, instructions shall specify methods for the RESPONSIBLE BODY to check the effective operation of devices or systems for overtemperature protection or liquid-level protection which are necessary for safety, and shall state how often the checks need to be made.

Addition:

Add the following new subclause: <https://standards.iteh.ai/catalog/standards/sist/65474fd2-509a-411a-84f7-877fbc5b68de/iec-61010-2-010-2019>

5.4.101 Additional instructions for equipment intended for use with flammable liquid HEAT TRANSFER MEDIUM

For baths, circulators and shaking baths intended for use with flammable liquid HEAT TRANSFER MEDIUM, the instructions shall include sufficient information to ensure the safe handling, servicing and disposal of the equipment.

The instructions shall include the substance of the following warnings as necessary:

- WARNING: Ensure all ventilation openings are not obstructed;
- WARNING: No smoking! No flame! Do not use electrical parts which can produce spark when operating around the equipment and the application system;
- WARNING: Drain and recover the liquid when the equipment idles, if the liquid heat transfer medium is used with an open bath tank and if it is highly volatile at ambient temperature.

A label carrying symbol 101 shall be provided with equipment which can be used with a flammable liquid HEAT TRANSFER MEDIUM along with instructions for the RESPONSIBLE BODY to affix the label visibly on the equipment if it is to be used with a flammable liquid HEAT TRANSFER MEDIUM.

The instructions shall be provided with detailed information for procedures to reduce the RISK with regard to the use of a flammable liquid HEAT TRANSFER MEDIUM, including how the adjustable temperature-limiting device is adequately set so that the surface temperature in contact with the liquid is below the limit of 9.5 a).

Conformity is checked by inspection.