

INTERNATIONAL STANDARD

IEC 61010-2-010

Second edition
2003-06

GROUP SAFETY PUBLICATION

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

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

*Règles de sécurité pour appareils électriques
de mesurage, de régulation et de laboratoire –*

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



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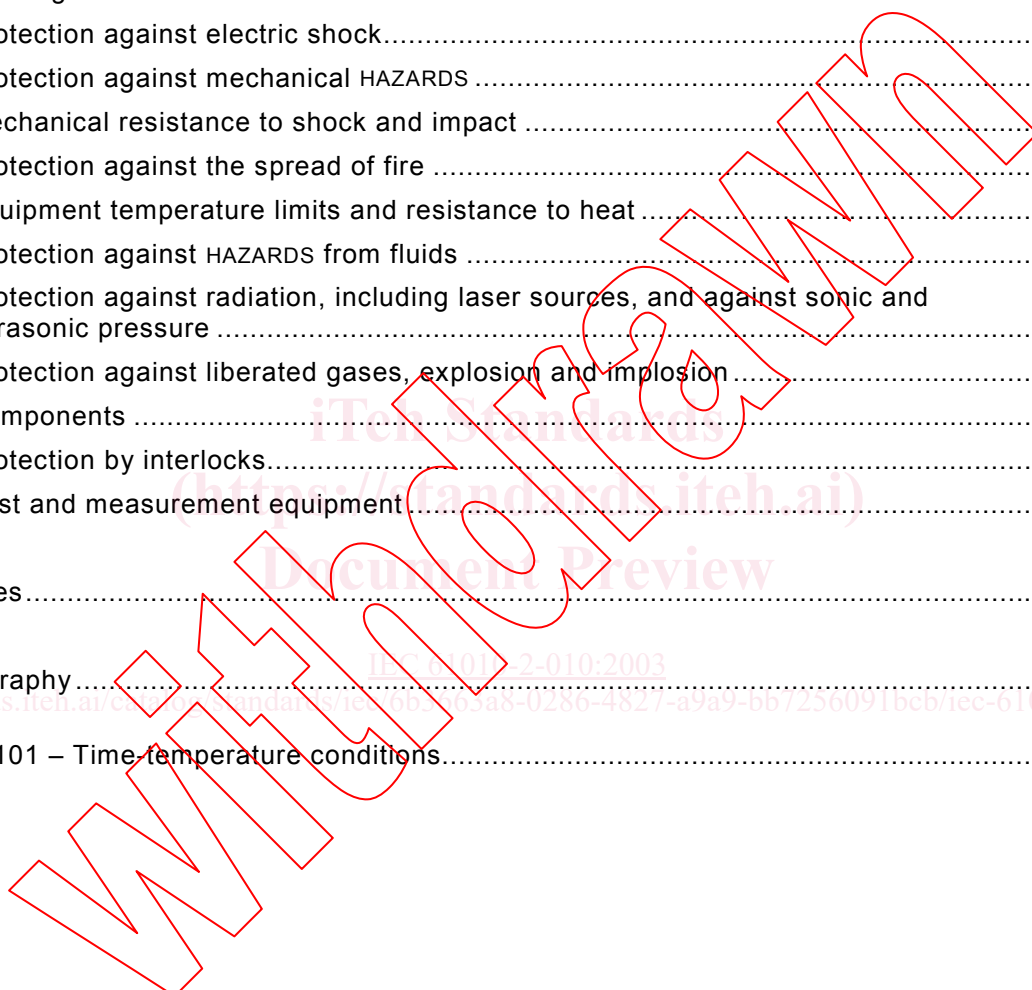
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**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 IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
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- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The 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.

This second edition cancels and replaces the first edition published in 1992, of which it constitutes a technical revision.

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
66/324/FDIS	66/329/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 2-010 is intended to be used in conjunction with IEC 61010-1. It was established on the basis of the second edition (2001). Consideration may be given to future editions of, or amendments to, IEC 61010-1.

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

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: 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.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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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 text by the following:

This part of IEC 61010 applies only to electrically powered laboratory equipment for the heating of materials, where the heating of materials is the only function or is one of several functions of the equipment.

NOTE 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 will also need to meet the requirements of those other part 2 standards. In particular, if equipment is intended to be used for IVD purposes, it will need to meet the requirements of IEC 61010-2-101

1.1.2 Equipment excluded from scope

Addition:

Add the following three new items after item i)

- aa) equipment for the heating and ventilation of laboratories;
- bb) sterilizing equipment;
- cc) heating 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.

3 Terms and definitions

This clause of Part 1 is applicable

4 Tests

This clause of Part 1 is applicable except as follows:

4.3.2 State of equipment

Addition:

Add the following note after the first paragraph:

NOTE In case of doubt, a test may have to be made with more than one combination of conditions.

4.4.2.10 Heating devices

Addition:

Add the following new second paragraph:

If a HAZARD could be caused by overfilling or underfilling with a heat transfer medium, the equipment shall be tested when 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.

4.4.4 Conformity after application of fault conditions

4.4.4.2

Replacement:

Replace the second paragraph by the following new paragraph:

Except for heated surfaces of heating equipment (see 10.1), whether they are intended to deliver heat or are hot because of proximity to heating parts, the temperature of such surfaces and parts shall not exceed 105 °C in an ambient temperature of 40 °C or the maximum RATED ambient temperature if higher (see 1.4.2).

5 Marking and documentation

This clause of Part 1 is applicable except as follows:

5.1.3 MAINS supply

Addition:

Add the following note to item c):

NOTE 101 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.

5.1.6 Switches and circuit-breakers

Addition:

Add a third paragraph as follows:

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.

5.2 Warning markings

Replacement:

Replace the fifth paragraph by the following:

Warning markings are specified in 5.1.5.1 c), 5.2.101, 6.1.2 b), 6.1.2.101 2), 6.5.1.2 g), 6.6.2, 7.2 c), 7.3, 10.1, and 13.2.2.

Addition:

Add the following new subclause:

5.2.101 Equipment with high ACCESSIBLE current

If the ACCESSIBLE current of the equipment exceeds the limit of 6.3.1 b) or 6.3.2 b) for non-permanently connected equipment, but is within the limit for PERMANENTLY CONNECTED EQUIPMENT, there shall be a warning marking against non-permanent connection to the supply source. The marking shall be on or beside the cover of the TERMINALS for connection to the supply source, and the warning shall be repeated in the installation instructions. Symbol 14 of Table 1 is an adequate warning marking, particularly when it may not be known in which country the equipment will be used and, therefore, in which language it would be appropriate to print the warning marking.

Conformity is checked by inspection.

5.4.3 Equipment installation

Replacement:

The documentation shall include installation and specific commissioning instructions (examples are listed below) and, if necessary for safety, warnings against HAZARDS which could arise during installation or commissioning of the equipment:

- 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 must not be mounted on a surface of flammable material;
- b) instructions for protective earthing;
- c) connections to the supply, including the warning and statement which are necessary when permanent connection to the supply source is essential (see 5.2.101), 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 6.11.2.1) and external overcurrent protection devices (see 9.5.1), and a recommendation that the switch or circuit-breaker be near the equipment;
- e) ventilation requirements;
- f) requirements for special services, for example, air, cooling liquid;
- g) the maximum sound power level produced by equipment which emits sound, if measurement is required by 12.5.1;
- h) instructions relating to sound pressure 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 gases, installation instructions shall warn of any need for an extraction system, additional temperature-limiting devices relating to safe temperatures for the materials, etc. (also see the note to 5.4.1).

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

Additional 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 standard, 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 standard during the drying-out process.

Conformity is checked by inspection.

5.4.4 Equipment operation

Addition:

Add the following reference at the end of item g):

(See 5.4.4.101)

Add the following three new items:

- 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 (also see 5.4.3 j));
- cc) specification of heat transfer media which are suitable for use, for example liquids for use in a heating bath.

Additional 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 must ensure that:

- a) appropriate decontamination is carried out if hazardous material is split 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 his 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.

If a manufacturer claims that an item can be decontaminated by steam sterilization, it shall be capable of withstanding steam sterilization under at least one of the time-temperature conditions given in Table 101.