

INTERNATIONAL STANDARD

HORIZONTAL PUBLICATION

**Safety requirements for electrical equipment for measurement, control, and
laboratory use -
Part 2-020: Particular requirements for laboratory centrifuges**

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CONTENTS

FOREWORD	2
1 Scope and object	4
2 Normative references	5
3 Terms and definitions	5
4 Tests	6
5 Marking and documentation	7
6 Protection against electric shock	10
7 Protection against mechanical HAZARDS	10
8 Resistance to mechanical stresses	16
9 Protection against the spread of fire	16
10 Equipment temperature limits and resistance to heat	17
11 Protection against HAZARDS from fluids and solid foreign objects	17
12 Protection against radiation, including laser sources, and against sonic and ultrasonic pressure	18
13 Protection against liberated gases, explosion and implosion and escape of microbiological materials	18
14 Components and subassemblies	19
15 Protection by interlocks	19
16 HAZARDS resulting from application	19
17 RISK assessment	19
Annexes	20
Annex L (informative) Index of defined terms	20
Annex AA (normative) Dynamic microbiological test method for BIOSEALS	21
Annex BB (informative) General guidance and rationale for particular subclauses	24
Annex CC (informative) General guidance for an empirical method to determine the kinetic energy of a ROTOR	28
Bibliography	30
Figure CC.1 – ROTOR test setup	28
Table 101 – Time-temperature conditions	17

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**Safety requirements for electrical equipment for
measurement, control, and laboratory use -
Part 2-020: Particular requirements for laboratory centrifuges**

FOREWORD

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IEC 61010-2-020 has been prepared by IEC technical committee 66: Safety of measuring, control and laboratory equipment. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2016. 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 1:2016 of IEC 61010-1:2010.

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

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

Draft	Report on voting
66/820/CDV	66/868/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

This Part 2-020 is intended 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 2-020 supplements or modifies the corresponding clauses in IEC 61010-1 so as to convert that publication into the IEC standard: *Particular requirements for laboratory centrifuges*.

Where a particular subclause of IEC 61010-1 is not mentioned in this Part 2-020, that subclause applies as far as is reasonable. Where this Part 2-020 states "addition", "modification" or "replacement", the relevant requirement, test specification or note in IEC 61010-1 shall be adapted accordingly.

In this standard:

- the following print types are used:
 - requirements: in roman type;
 - NOTES: in small roman type;
 - *conformity and tests: in italic type*;
 - terms used throughout this standard which have been defined in Clause 3: SMALL ROMAN CAPITALS.
- subclauses, tables or figures which are additional to those in IEC 61010-1 are numbered starting from 101. Additional annexes are lettered starting from AA.

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.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

1 Scope and object

IEC 61010-1:2010, Clause 1 and IEC 61010-1:2010/AMD1:2016, Clause 1 apply except as follows:

1.1 Scope

1.1.1 Equipment included in scope

Replacement:

This part of IEC 61010 is applicable to electrically powered LABORATORY CENTRIFUGES.

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 document. In that case, the requirements of those other Part 2 standards will also apply.

1.1.2 Equipment excluded from scope

Addition:

Add the following new item:

- aa) IEC 60034 series (Rotating electrical machines).

1.2 Object

1.2.1 Aspects included in scope

Addition:

Add the following new items:

- aa) contact with moving parts (see 7.3);
- bb) LABORATORY CENTRIFUGE movement during any DISRUPTION (see 7.4.101);
- cc) high energy chemical reaction after ROTOR DISRUPTION (see 7.7.2.2 k));
- dd) ineffectiveness of BIOSEALS (see 13.101).

1.2.2 Aspects excluded from scope

Addition:

Add the following new items:

- aa) additional precautions which are observed when centrifuging materials which are flammable or explosive (see 5.4.101);
- bb) additional precautions which are observed when centrifuging materials that could react chemically with sufficient vigour to cause a HAZARD (see 5.4.101).

1.4 Environmental conditions

1.4.1 Normal environmental conditions

Replacement:

Replace item c) with the following:

- c) temperature 2 °C to 40 °C;

1.4.2 Extended environmental conditions

Replacement:

Replace item c) with the following:

- c) ambient temperatures below 2 °C or above 40 °C;

2 Normative references

IEC 61010-1:2010, Clause 2 and IEC 61010-1:2010/AMD1:2016, Clause 2 apply except as follows:

Addition:

ISO 3864 (all parts), *Graphical symbols - Safety colours and safety signs*

3 Terms and definitions

IEC 61010-1:2010, Clause 3 applies except as follows:

3.1 Equipment and states of equipment

Addition:

Add the following new terms and definitions:

3.1.101

LABORATORY CENTRIFUGE

apparatus intended for laboratory use that applies a centrifuging effect to sample materials

3.1.102

CENTRIFUGE-ROTOR COMBINATION

LABORATORY CENTRIFUGE and ROTOR ASSEMBLY that are intended to operate together and which have to be evaluated together

3.1.103

DISRUPTION

event in which the ROTOR ASSEMBLY, or part of it, fails or becomes detached during rotation

3.2 Parts and accessories

Addition:

Add the following new terms and definitions:

3.2.101

CHAMBER

enclosed space within a LABORATORY CENTRIFUGE in which the ROTOR ASSEMBLY rotates

3.2.102

ROTOR

primary component of a LABORATORY CENTRIFUGE which holds the material to be subjected to centrifugal force and which is rotated by the DRIVE SYSTEM

3.2.103

BUCKET

sub-assembly of a ROTOR designed to support one or more containers

3.2.104

PROTECTIVE CASING

casing which completely surrounds the ROTOR ASSEMBLY and which includes the LID and its securing devices

3.2.105

LID

access cover of the CHAMBER

3.2.106

ROTOR ASSEMBLY

ROTOR carrying a combination of ROTOR accessories specified by the manufacturer

Note 1 to entry: In the context of a ROTOR ASSEMBLY, ROTOR accessories include all components used with or in the centrifuge ROTOR for the purpose of holding samples, including adaptors, BUCKETS, tubes and bottles.

3.2.107

DRIVE SYSTEM

all components of the LABORATORY CENTRIFUGE associated with the provision of torque to, or the rotational support of, the ROTOR ASSEMBLY

3.2.108

BIOSEAL

device or mechanism additional to, or integral with, a ROTOR or BUCKET and a closure assembly, and which is designed to prevent the escape of contents, for example microbiological material, during centrifuging

3.5 Safety terms

Addition:

Add the following new terms and definitions:

3.5.101

CLEARANCE ENVELOPE

space around a LABORATORY CENTRIFUGE which is needed for safety

3.5.102

MCA

MAXIMUM CREDIBLE ACCIDENT

event chosen to represent worst-case conditions for a test that will evaluate the inherent mechanical safety of a CENTRIFUGE-ROTOR COMBINATION

Note 1 to entry: See 7.7 and Annex BB.

4 Tests

IEC 61010-1:2010, Clause 4 and IEC 61010-1:2010/AMD1:2016, Clause 4 are applicable.

5 Marking and documentation

IEC 61010-1:2010, Clause 5 and IEC 61010-1:2010/AMD1:2016, Clause 5 apply except as follows:

5.1.2 Identification

Addition:

Add the following new item:

- aa) serial number or other means to identify the production batch of the equipment.

5.1.3 MAINS supply

Addition:

Add the following note after the compliance statement.

NOTE 101 The maximum power or input current considered is usually during the acceleration phase of the ROTOR, with any options such as cooling or heating energized.

Add the following new subclause:

5.1.101 ROTORS and accessories

All OPERATOR-replaceable ROTORS and ROTOR ASSEMBLIES, including ROTOR accessories, shall be marked with the manufacturer's or supplier's name or registered trademark, and identification code (such as ID code, serial number or batch number).

If components are too small, or are not suitable for such marking, the required information shall be marked on the original packaging, as well as being stated in the documentation.

NOTE Packaging can be the outer box, an insert, etc.

If the manufacturer specifies that an individual part, for example a BUCKET, is to be fitted only to a specific ROTOR or in specific ROTOR positions for balance or some other reason, each BUCKET and ROTOR position shall be identified by marking with corresponding numbers or letters.

Conformity is checked by inspection.

5.4.2 Equipment RATINGS

Addition:

Add the following new items:

- aa) a list of all ROTORS and ROTOR accessories specified for use with a LABORATORY CENTRIFUGE, together with their RATED rotational frequencies;
- bb) any restrictions by the manufacturer warning against the use of particular materials to be centrifuged;
- cc) density and volume limits for ROTOR ASSEMBLY loading and, if applicable, derating instructions.