

Safety requirements for electrical equipment for measurement, control, and laboratory use —

Part 2-020: Particular requirements for laboratory centrifuges

The European Standard EN 61010-2-020:2006 has the status of a British Standard

ICS 19.080; 71.040.10

National foreword

This British Standard was published by BSI. It is the UK implementation of EN 61010-2-020:2006. It is identical with IEC 61010-2-020:2006. It supersedes BS EN 61010-2.020:1995 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/66, Safety of measuring, control and laboratory equipment.

A list of organizations represented on EPL/66 can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Amendments issued since publication

Amd. No.	Date	Comments

**Safety requirements for electrical equipment
for measurement, control, and laboratory use
Part 2-020: Particular requirements
for laboratory centrifuges
(IEC 61010-2-020:2006)**

Règles de sécurité pour appareils
électriques de mesure, de régulation
et de laboratoire
Partie 2-020: Exigences particulières
pour centrifugeuses de laboratoire
(CEI 61010-2-020:2006)

Sicherheitsbestimmungen für
elektrische Mess-, Steuer-, Regel- und
Laborgeräte
Teil 2-020: Besondere Anforderungen
an Laborzentrifugen
(IEC 61010-2-020:2006)

This European Standard was approved by CENELEC on 2006-07-01. 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, 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

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Foreword

The text of document 66/367/FDIS, future edition 2 of IEC 61010-2-020, 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 61010-2-020 on 2006-07-01.

This European Standard supersedes EN 61010-2-020:1994 + A1:1996.

It has been updated to provide more specific wording for some of the instructions or subclauses, and the language has been updated to reflect current terminology used in the industry today.

This Part 2-020 is to be used in conjunction with EN 61010-1:2001, Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements. Consideration may be given to future editions of, or amendments to, EN 61010-1.

This Part 2-020 supplements or modifies the corresponding clauses of EN 61010-1:2001 so as to convert it into the European Standard "Safety requirements for laboratory centrifuges".

Where a particular clause or subclause of Part 1 is not mentioned in this Part 2-020, that clause or subclause applies as far as is reasonable. Where this part states "addition", "modification" or "replacement", the relevant text of Part 1 is to be adapted accordingly.

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) | 2007-04-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2009-07-01 |

In this standard:

- 1) the following print types are used:
 - requirements: in roman type;
 - NOTES: in small roman type;
 - *conformity and tests: 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 AA, BB, etc.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61010-2-020:2006 was approved by CENELEC as a European Standard without any modification.

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

Part 2-020: Particular requirements for laboratory centrifuges

1 Scope and object

This clause of Part 1 is applicable except as follows:

1.1 Scope

Replacement:

This Part 2 is applicable to electrically powered LABORATORY CENTRIFUGES.

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.

1.1.2 Equipment excluded from scope

Addition:

Add the following new item:

- aa) IEC 60034 (Rotating electrical machinery);

1.2 Object

1.2.1 Aspects included in scope

Addition:

Add the following five new items:

- aa) contact with moving parts (see 7.2);
- bb) LABORATORY CENTRIFUGE movement during any DISRUPTION (see 7.3.101);
- cc) high energy chemical reaction after ROTOR DISRUPTION (see 7.6.101.2 I);
- dd) ineffectiveness of BIOSEALS (see 13.101)

1.2.2 Aspects excluded from scope

Addition:

Add the following two new items:

- aa) additional precautions which may need to be observed when centrifuging materials which are flammable or explosive (see 5.4.101);
- bb) additional precautions which may need to be 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

Modification:

Modify item c) as follows:

c) temperature 2 °C to 40 °C;

1.4.2 Extended environmental conditions

Modification:

Modify item c) as follows:

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

2 Normative references

This clause of Part 1 is applicable except as follows:

Addition:

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

3 Terms and definitions

This clause of Part 1 is applicable except as follows:

3.1 Equipment and states of equipment

Additions:

Add the following three new 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

Additions:

Add the following eight new 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 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, tubes and bottles.

3.2.107

DRIVE SYSTEM

all components of the 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 micro-biological material, during centrifuging.

3.5 Safety terms

Additions:

Add the following two new definitions:

3.5.101

CLEARANCE ENVELOPE

space around a LABORATORY CENTRIFUGE which is needed for safety

3.5.102

MCA (MAXIMUM CREDIBLE ACCIDENT)

a planned event chosen to represent worst-case conditions for a test that will evaluate the inherent mechanical safety of a CENTRIFUGE-ROTOR COMBINATION (see 7.6 and Annex BB).

4 Tests

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

4.3.1 Environmental conditions

Addition:

Add the following new note:

NOTE Consideration should be given to operating refrigerated centrifuges at the maximum humidity specified in 1.4.1 d) and 1.4.2 d) because of condensation concerns (see 11.101).

5 Marking and documentation

This clause of Part 1 is applicable except as follows.

5.1.2 Identification

Modification:

Modify item b) as follows:

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

Addition:

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 trade mark, and identification code.

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

NOTE 2 Each ROTOR should be marked with a serial number or with other means to identify uniquely the production batch.

NOTE 3 Where 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 should be identified by marking with corresponding numbers or letters;

NOTE 4 ROTOR accessories designed to be used together as a set, for example in terms of weight, should be marked with an identification of that same set.

Conformity is checked by inspection.

5.4.2 Equipment ratings

Addition:

Add the following three 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.

5.4.3 Equipment installation

Addition:

Add, after item a), the following five sub-items:

- i) floor or bench area required for the CLEARANCE ENVELOPE for the intended use (see 7.3.101);

NOTE Subclause 7.3.101 limits the permitted movement of a LABORATORY CENTRIFUGE to 300 mm, in the event of a DISRUPTION. The manufacturer's instructions should therefore include a requirement for the user to mark this boundary around the CENTRIFUGE, or that laboratory management procedures should require that no person or any hazardous materials be within such a boundary while the LABORATORY CENTRIFUGE is operating.
- ii) total weight of the CENTRIFUGE;
- iii) instructions for site preparation;
- iv) methods for levelling of the CENTRIFUGE;
- v) means for securing to the mounting surface.

5.4.4 Equipment operation

Addition:

Add the following five new items:

- aa) loading and balancing procedures;
- bb) ROTOR changing procedure;
- cc) any specific requirement for an OPERATOR to be present at stated phases of the centrifuging procedure;
- dd) necessary safeguards for personnel. Examples of instructions include:
 - not to lean on a LABORATORY CENTRIFUGE;
 - not to stay within the CLEARANCE ENVELOPE longer than necessary for operational reasons;
 - not to deposit any potentially hazardous materials within the CLEARANCE ENVELOPE;
 - methods for safe operation during open LID procedures (see 7.2.102.2);

- ee) instructions for use of BIOSEALS and other biocontainment components, including the proper closure techniques. These instructions shall make clear to the OPERATOR that BIOSEALS and related components are intended to be part of biocontainment systems such as are specified in international and national biosafety guidelines, and cannot be relied on as the only means of safeguarding workers and the environment when handling pathogenic micro-organisms.

5.4.5 Equipment maintenance

Addition:

Renumber the note to the first paragraph as Note 1 and add the following new second paragraph and Note 2:

Where applicable, the instructions shall specify:

- aa) inspection of any means of fixing the equipment to the mounting surface and the condition of the mounting surface itself;
- bb) safeguards for the OPERATOR during cleaning;
- cc) inspection of the PROTECTIVE CASING;
- dd) inspection of the ROTOR ASSEMBLY, and safety considerations;
- ee) checking the continuity of the PROTECTIVE BONDING;
- ff) frequency of inspection and the method of replacement of BIOSEALS and other biocontainment components.

NOTE 2 These instructions should make clear to the OPERATOR that regular maintenance of BIOSEALS and other biocontainment components as specified in the instructions is especially important to ensure safety in day-to-day use.

Addition:

Add the following three new subclauses:

5.4.101 Hazardous substances

The instructions for use shall state the precautions to be observed when the materials to be used with a LABORATORY CENTRIFUGE are known to be toxic, radioactive, or contaminated with pathogenic micro-organisms.

NOTE 1 This information is relevant to the safety of both OPERATORS and service personnel.

The use within the LABORATORY CENTRIFUGE of the following materials shall be prohibited in the instructions for use:

- a) flammable or explosive materials;
- b) materials which could react chemically with sufficient vigour to cause a HAZARD.

NOTE 2 CENTRIFUGES may be specifically designed to be safe when handling such materials, but such centrifuges are not within the scope of this standard.

Conformity is checked by inspection.

5.4.102 Cleaning and decontamination

Documentation shall include:

- a) a statement that, if hazardous material is spilt on or inside the equipment, the user has responsibility for carrying out appropriate decontamination;