BS EN 61010-2-051:2015

BSI Standards Publication

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

Part 2-051: Particular requirements for laboratory equipment for mixing and stirring

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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 this committee can be obtained on request to its secretary.

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Published by BSI Standards Limited 2015

ISBN 978 0 580 79879 5
ICS 19.080; 71.040.20

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 May 2015.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61010-2-051

April 2015

ICS 19.080; 71.040.20

Supersedes EN 61010-2-051:2003

English Version

Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-051: Particular requirements for laboratory equipment for mixing and stirring (IEC 61010-2-051:2015)

Règles de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire - Partie 2-051: Exigences particulières pour appareils de laboratoire utilisés pour mixer et agiter
(IEC 61010-2-051:2015)

Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte - Teil 2-051: Besondere Anforderungen an Laborgeräte zum Mischen und Rühren
(IEC 61010-2-051:2015)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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

Foreword

The text of document 66/552/FDIS, future edition 3 of IEC 61010-2-051, 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 61010-2-051:2015.

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)	2016-01-14
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2018-04-14

This document supersedes EN 61010-2-051:2003.

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.

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

Endorsement notice

The text of the International Standard IEC 61010-2-051:2015 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

The Bibliography of Part 1 is applicable, except as follows:

IEC 60079 (series)	NOTE	Harmonized as EN 60079 (series).
IEC 61010-2-010	NOTE	Harmonized as EN 61010-2-010.

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.

Annex ZA of Part 1 applies.

Addition

Publication	Year	Title	EN/HD	Year
IEC 62061	-	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	EN 62061	-
-	-		+corrigendum Feb.	-
ISO 13849	series	Safety of machinery - Safety-related parts of control systems	EN ISO 13849	series

CONTENTS

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

Part 2-051: Particular requirements for laboratory equipment for mixing and stirring

1 Scope and object

This clause of Part 1 is applicable except as follows:

1.1 Scope

Replacement:

Replace the text in 1,1 by the following paragraph:

This part of IEC 61010 is applicable to electrically operated laboratory equipment and its accessories for mechanical mixing and stirring, where mechanical energy influences the shape or size or homogeneity of materials and their accessories. Such devices may contain heating elements.

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, consideration is to be given to those other Part 2 standards. The standard for equipment which contain heating devices is IEC 61010-2-010.

2 Normative references

This clause of Part 1 is applicable except as follows:

Addition:

Add the following references to the list:

IEC 62061, *Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems*

ISO 13849, *Safety of machinery – Safety-related parts of control systems*

3 Terms and definitions

This clause of Part 1 is applicable.

4 Tests

This clause of Part 1 is applicable.

5 Marking and documentation

This clause of Part 1 is applicable except as follows:

5.4.1 General

Addition:

Add, after item h), the following new item:

aa) if a HAZARD could be caused by operating a mixer or stirrer intended for use as HAND-HELD EQUIPMENT, there shall be a warning statement to that effect.

5.4.4 Equipment operation

Additions:

Add after item j), the following new item:

aa) instructions for fixing the stirring vessel if specified and sold as part of a mixing system, or if otherwise applicable.

Add a new paragraph after the list of items as follows:

The instructions shall warn against use of the equipment in hazardous atmospheres or with hazardous materials for which the equipment is not designed.

Replacement:

Replace the paragraph before the compliance statement by the following:

The user shall be made aware that the protection provided by the equipment may be impaired if the equipment is used with accessories not provided or recommended by the manufacturer, or used in a manner not specified by the manufacturer.

6 Protection against electric shock

This clause of Part 1 is applicable.

7 Protection against mechanical HAZARDS

This clause of Part 1 is applicable except as follows:

7.3.2 Exceptions

Replacement:

Replace, in item a), the words "for example drilling and mixing equipment" *by the following:*

for example stirrer shafts and impellers extending downwards into material being stirred.

Addition:

Add the following subclauses:

7.3.101 Speed controls

If a SINGLE FAULT of an electronic speed control could cause a HAZARD, the equipment shall incorporate means to interrupt power or otherwise prevent the HAZARD.

Conformity is checked by inspection and test.

7.3.102 Movement during operation

Equipment shall not change position during NORMAL USE.

Conformity is checked by inspection and test. Equipment which has not moved by more than 5 mm after operation for 10 min is considered to meet the requirement.

7.3.103 Restarting after interruption

Depending on the operation, a HAZARD may be caused either by re-starting or by not re-starting after interruption of the mixing action. Instructions shall specify whether equipment will re-start or not re-start, both in the case of MAINS interruption and in the case of a fault or mechanical interruption. If after interruption a hazard can occur the equipment shall be equipped with an audible or visible signal to warn that an interruption has occurred.

Conformity is checked by inspection of documentation.

7.3.104 HAZARDS related to application

Additional HAZARDS may occur with equipment used to mix flammable materials, or where the transfer of mechanical energy to glass apparatus could lead to breakage.

Instructions for use shall warn against the use of equipment in such applications unless the equipment incorporates appropriate safety devices to prevent a HAZARD in SINGLE FAULT CONDITION. Such safety devices shall be independent from control systems.

Examples of HAZARDS and appropriate safety devices include the following.

a) Where failure of the mixing action could cause a HAZARD, for example in metal-organic reactions, the safety device shall initiate an alarm signal:
   1) if the drive shaft or mixer fails to turn when the mixer is switched on; or
   2) when an overload causes the shaft speed to fall below a preset level.

   NOTE Speed reduction can be caused by a lack of power or by the operation of an automatic device which reduces the shaft speed in the case of an overload.

b) Where a hazard could be caused by excessive torque applied to high-viscosity material, for example through glass breakage, the safety device shall initiate an alarm signal if the torque rises above a preset level. It is recommended that safety devices work according to the principle of rest-current.

Conformity is checked by inspection and test.

8 Resistance to mechanical stresses

This clause of Part 1 is applicable except as follows:

8.1 General

Replacement:

Replace the text of item 3) by the following:

3) except for FIXED EQUIPMENT, for equipment with a mass over 100 kg, or for equipment whose size and weight make unintentional movement unlikely and which is not moved in NORMAL USE, the appropriate test of 8.3. The equipment is not operated during the tests.

9 Protection against the spread of fire

This clause of Part 1 is applicable.

10 Equipment temperature limits and resistance to heat

This clause of Part 1 is applicable.

11 Protection against HAZARDS from fluids

This clause of Part 1 is applicable except as follows:

Addition:

Add the following subclause:

11.101 Connections for hoses and pipes

Connectors shall be so designed that hoses can be prevented from detaching, for example by means of hose clamps, and that pipes are adequately restrained.

Conformity is checked by inspection.

12 Protection against radiation, including laser sources, and against sonic and ultrasonic pressure

This clause of Part 1 is applicable.

13 Protection against liberated gases and substances, explosion and implosion

This clause of Part 1 is applicable except as follows:

Addition:

Add the following subclause:

13.2.101 Protection against explosion and explosives

Equipment designed for protection against explosion or to be used with explosives shall, according to the type, the mode of operation and the location, comply with the appropriate requirements of relevant IEC and ISO standards such as the IEC 60079 series, explosive atmosphere standards.

Conformity is checked as specified in the relevant standards.

14 Components and subassemblies

This clause of Part 1 is applicable.

15 Protection by interlocks

This clause of Part 1 is applicable except as follows:

15.1 General

Addition:

Add a new paragraph as follows:

As an alternative method, for interlock systems containing electric/electronic or programmable components (E/E/P components) the reliability and design requirements can be determined by applying e.g. IEC 62061 (SIL) or ISO 13849 (PL) or other solutions providing equivalent functional safety.

16 HAZARDS resulting from application

This clause of Part 1 is applicable.

17 RISK Assessment

This clause of Part 1 is applicable.

Annexes

The annexes of Part 1 are applicable.

Bibliography

The Bibliography of Part 1 is applicable, except as follows.

Addition:

Add the following references:

IEC 61010-2-010, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-010: Particular requirements for laboratory equipment for the heating of materials*

IEC 60079 (all parts), *Explosive atmospheres*

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