

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

**Part 3-061: Conformity verification
report for IEC 61010-2-061, Particular
requirements for laboratory atomic
spectrometers with thermal atomization
and ionization**

ICS 03.120.20; 19.080; 71.040.10

National foreword

This British Standard reproduces verbatim IEC 61010-3-061:1999 and implements it as the UK national standard.

The UK participation in its preparation was entrusted to Technical Committee EPL/66, Safety requirements for electrical equipment for measurement, control, and laboratory use, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

From 1 January 1997, all IEC publications have the number 60000 added to the old number. For instance, IEC 27-1 has been renumbered as IEC 60027-1. For a period of time during the change over from one numbering system to the other, publications may contain identifiers from both systems.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the IEC title page, pages 2 to 62, an inside back cover and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

This British Standard, having been prepared under the direction of the Electrotechnical Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 October 1999

© BSI 10-1999

ISBN 0 580 32958 5

Amendments issued since publication

Amd. No.	Date	Comments

TECHNICAL REPORT

IEC
61010-3-061

First edition
1999-02

**Safety requirements for electrical equipment
for measurement, control, and laboratory use –
Part 3-061:
Conformity verification report for IEC 61010-2-061,
Particular requirements for laboratory atomic
spectrometers with thermal atomization and ionization**

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

*Partie 3-061:
Rapport de vérification de la conformité de la CEI 61010-2-061,
Specifications particulières pour les spectromètres
à atomisation et ionisation thermiques*



Reference number
IEC 61010-3-061:1999(E)

CONTENTS

	Page
FOREWORD	3
Conformity verification report IEC 61010-2-61	5
 Clause	
5 Marking and documentation	10
6 Protection against electric shock	16
7 Protection against mechanical hazards	24
8 Mechanical resistance to shock, vibration and impact (AM 1 only) Mechanical resistance to shock and impact (AM 2)	25
9 Equipment temperature limits and protection against the spread of fire	26
10 Resistance to heat	27
11 Resistance to moisture and liquids (AM 1 only) Protection against hazards from fluids (AM 2)	27
12 Protection against radiation, including laser sources, and against sonic and ultrasonic pressure	29
13 Protection against liberated gases, explosion and implosion	30
14 Components	32
15 Protection by interlocks	33
16 Measuring circuits	33
Annex K Routine tests	33
 Tables	
1 Documents attached to this report	7
2 Test equipment list	8
3 List of components relied on for safety	9
 Form A.1 to Form A.29	34 to 62

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 3-061: Conformity verification report for IEC 61010-2-061, Particular requirements for laboratory atomic spectrometers with thermal atomization and ionization

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 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.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 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.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

Technical reports do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

IEC 61010-3-061, which is a technical report, has been prepared by IEC technical committee 66: Safety of measuring, control, and laboratory equipment.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
66/182/CDV	66/209/RVC

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

This report is a Technical Report and is of a purely informative nature and is therefore by itself not to be regarded as an international Standard. It is for use by testhouses and other users to assist them with determining and recording verification of conformity of the equipment under test with the requirements of:

IEC 61010-2-061:1995
and
IEC 61010-1:1990 + amendment 1:1992,
or
IEC 61010-1:1990 + amendment 1:1992 + amendment 2:1995

The protocol for completion of this report is contained in publication IEC 61010-3: 1997.

Requirements which apply only to amendment 2 to IEC 61010-1 are indicated by "(AM 2)" in the first column. Requirements deleted by amendment 2 to IEC 61010-1 are indicated by "(AM 1 only)" in the second column.

The IEC sells read-only PDF files as a general rule. In the present instance, and quite exceptionally, to enable the user to fill in the forms, a revisable file is included in a pocket affixed to the back cover of this publication.

This publication can be down-loaded from the Web as a PDF file. There is, however, at the end of the document, a revisable file containing the forms. Please use the zip/unzip function.

Conformity Verification Report IEC 61010-2-061: Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-061:1995, Particular requirements for laboratory atomic spectrometers with thermal atomization and ionization	
Report reference No: Compiled by (+ signature).....: Approved by (+ signature): Date of issue.....:	
Testing organization: Address.....: Testing location:	
Applicant.....: Address.....:	
Standard:	IEC 61010-2-061:1995 and IEC 61010-1:1990 + A1:1992 or IEC 61010-1:1990 + A1:1992 + A2:1995
Copyright blank test report:	This report has been prepared by IEC TC 66, which retains responsibility for any changes or corrections required.
Test procedure: Procedure deviation: Non-standard test method:	
Type of item tested:	Laboratory
Trade mark.....: Model/type reference: Manufacturer: Rating:	
Copy of rating plate:	

Description of equipment function				
INSTALLATION/OVERVOLTAGE CATEGORY				
POLLUTION DEGREE:				
Environmental rating:	Standard	Other (specify):		
Equipment mobility:	Portable Built in	Hand-held Benchmounted	Floorstanding Other (specify):	Fixed
Connection to mains supply:	Permanent	Detachable	Non detachable	None
Operating conditions:	Continuous	Short-time	Intermittent	
Overall size of the equipment (length × width × height):				
Mass of the equipment (kg):				
Marked degree of protection to IEC 60529: IP__ __				
Accessories and detachable parts included in the evaluation:				
Options:				
NOTE – "(see Form A.X)" refers to a Form appended to the report.				

Table 1 – Documents attached to this report

[illegible]

Table 2 – Test equipment list

[illegible]

Table 3 – List of components relied on for safety

Unique component reference or location (including drawing reference if required)	Application/Function	Manufacturer and part number (note 1)	RATING (note 2)	Licence number, file number or other documentary evidence of acceptance
NOTE 1 – List all manufacturers concerned. NOTE 2 – Electrical, mechanical, flammability, etc.				



Clause Subclause	Requirement	Result	Comments
5	Marking and documentation		
5.1.1	General Required equipment markings are: a) visible: – from the exterior or – after removing a cover or – opening a door or – after removal from a rack or panel b) not put on parts which can be removed by an OPERATOR c) Letter symbols (IEC 60027) used d) Graphic symbols (IEC 61010-1: table 1) used		
5.1.2	Identification Equipment is identified by: – manufacturer's name or registered trade mark – model number, name or other means – the degree of protection, if any, according to IEC 60529		
5.1.3	Mains supply Equipment is marked as follows: a) nature of supply: – a.c. RATED mains frequency or range of frequencies – d.c. with symbol 1 b) RATED supply voltage(s) or range c) – maximum RATED power (W or VA) or input current		
(AM 2)	If more than one voltage range:		
	– separate values marked		
F	or		
	– values differ by less than 20 % (see Form A.3)		

Result: P = Pass F = Fail NA = Not Applicable

Clause Subclause	Requirement	Result	Comments
	d) OPERATOR – set for different RATED supply voltages:		
	– indicates the equipment set voltage		
	– PORTABLE EQUIPMENT indication is visible from the exterior		
	– changing the setting changes the indication		
	e) Accessory mains socket-outlets accepting standard mains plugs are marked:		
	– with the voltage if it is different from the mains supply voltage		
	– for use only with specific equipment		
	If not marked for specific equipment it is marked with:		
	– the maximum RATED current or power, and maximum permitted leakage current		
	or		
	– symbol 14 with full details in the documentation		
	F The measured value not more than 110 % (see Form A.3)		
5.1.4	Fuses		
	OPERATOR replaceable fuse marking (see also 5.4.5)		
5.1.5	Measuring circuit TERMINALS		
(AM 2)	RATED maximum working voltage or current marked		
	Unless clear indication that below limits:		
	– maximum RATED voltage to earth is marked		
	or		
	– for specific connection only, and means for identifying provided		
	– is adjacent to TERMINALS		
	or		
	– if insufficient space:		
	– on the RATING plate or scale plate		
	or		
	– if the TERMINAL is marked with symbol 14		

Result: P = Pass F = Fail NA = Not Applicable

Clause Subclause	Requirement	Result	Comments
5.1.6	(AM 2) INSTALLATION CATEGORY marked		
	(AM 2) TERMINALS permanently connected and not ACCESSIBLE		
	TERMINALS and operating devices		
	Where necessary for safety, indication of purpose of TERMINALS, connectors, controls and indicators		
	(AM 2) Mains supply TERMINALS identified		
	(AM 2) Power supply switch on or off position marked if used as disconnecting device		
	TERMINAL marking:		
	a) FUNCTIONAL EARTH TERMINALS		
	b) PROTECTIVE CONDUCTOR TERMINALS:		
	– symbol 6 is placed close to or on the TERMINAL		
	or		
	– part of appliance inlet		
	c) TERMINALS of measuring and control circuits		
	d) TERMINALS supplied from the interior		
5.1.7	e) ACCESSIBLE FUNCTIONAL EARTH TERMINALS		
	f) Position on or off of power supply switch (AM 1 only)		
	Equipment protected by DOUBLE INSULATION or REINFORCED INSULATION		
5.1.8	Protected throughout (symbol 11 used)		
	Only partially protected (symbol 11 not used)		
	Battery charging		
	Equipment with means to charge rechargeable batteries is marked:		
	– to warn against the charging of non-rechargeable batteries		
	– to indicate the type of rechargeable battery used		

Clause Subclause	Requirement	Result	Comments
5.1.101	Gas and liquid connections Connectors unambiguously marked with: – identity of gas or liquid and – maximum pressure		
5.2	Warning markings – visible when ready for NORMAL USE – if necessary marked with symbol 14 – are near or on applicable parts (AM 2) – statement to isolate or disconnect – advice how to avoid contact with ACCESSIBLE HAZARDOUS LIVE parts – TERMINAL voltage exceeding 1 kV (symbol 12) – easily touched high temperature parts (symbol 13) – warning for more than 2 s (AM 1 only) Protective means against hot gases or plasma marked with symbol 13		
5.3	Durability of markings The required markings remain clear and legible F in NORMAL USE (see Form A.4)		
5.4	Documentation		
5.4.1	General Equipment is accompanied by documentation which includes: – technical specification – instructions for use – name and address of manufacturer or supplier (AM 2) Definition of INSTALLATION CATEGORY Warning statements and a clear explanation of warning symbols: – provided in the documentation or – information is marked on the equipment		

Result: P = Pass F = Fail NA = Not Applicable

Clause Subclause	Requirement	Result	Comments
5.4.2	Equipment RATINGS		
	Documentation includes:		
	– supply voltage or voltage range		
	– frequency or frequency range		
	– power or current RATING		
	– a description of all input and output connections		
	– RATING of insulation of external circuits, when such circuits are nowhere ACCESSIBLE		
5.4.3	– statement of the range of environmental conditions		
	Equipment installation		
	Documentation includes instructions for:		
	– assembly, location and mounting		
	– protective earthing		
	– connections to supply		
	– ventilation requirements		
	– requirements for supply connection of air, fuel gases, etc.		
	– user shall ensure that the type of connector used at the outlet side of the gas pressure regulator conforms to national requirements		
	– requirement for liquid connection		
	– requirement for fume extraction of hazardous gases		
	– requirements for trap of hazardous sample residues in the exhaust gas stream:		
	– appropriate filter		
	or		
	– other system		
	– instruction that user carries out appropriate leakage tests		
	– instruction for examining parts of the external gas supply system		
	– instruction for provisions for collecting waste of spray-chamber		

Clause Subclause	Requirement	Result	Comments
(AM 2)	– maximum sound power level		
(AM 2)	– instructions about sound pressure		
	Additional for permanently connected equipment:		
	– supply wiring		
	– any external switch or circuit-breaker (including location)		
	– any external overcurrent protection		
5.4.4	Equipment operation		
	Instructions for use include:		
	– identification of operating controls		
(AM 2)	– positioning for disconnection		
	– interconnection		
	– specification of intermittent operation limits		
	– explanation of symbols used		
	– replacement of consumable materials		
	– cleaning and decontamination (see 11.2)		
	– a reminder about correct collection and disposal of waste materials, including:		
	a) a suitably sized waste container		
	b) provisions for the removal into an exhaust system of any gases		
	– list of fluids known to be potentially unsafe if used with the equipment		
	– statement that the list is not complete; contact the manufacturer		
	A warning against use in a manner not specified by the manufacturer		
5.4.101	Cleaning and decontamination		
	Documentation indicates:		
	– user responsibility after hazardous material spillage		

Result: P = Pass F = Fail NA = Not Applicable

Clause Subclause	Requirement	Result	Comments
	– recommendations for cleaning/ decontamination and generic names		
	Wording "Before using any cleaning or, etc." in documentation		
	If decontamination by steam, withstands one method of table 101		
5.4.5	Equipment maintenance		
	Instructions include:		
	– sufficient preventive maintenance and inspection information		
(AM 2)	– replacement of hoses, etc.		
	– specific battery type		
	– any manufacturer specified parts		
	– RATING and characteristics of fuses		
6	Protection against electric shock		
F	(see Form A.5)		
6.1	General		
	Conformity is checked by the determination of 6.2 and 6.3 followed by the tests of 6.4 to 6.12		
6.1.1	Exceptions		
F	Capacitance test (see Forms A.6 and A.7)		
6.2	Determination of ACCESSIBLE parts		
F	(see Form A.6)		
6.3	Permissible limits for ACCESSIBLE parts		
6.3.1	Values in NORMAL CONDITION		
F	(see Form A.7)		
6.3.2	Values in SINGLE FAULT CONDITION		
F	(see Form A.8)		
6.4	Protection in NORMAL CONDITION		
	(see 6.8 and 8.1)		
6.5	Protection in SINGLE FAULT CONDITION		
	Additional protection is provided by:		
	– one or more of 6.5.1 to 6.5.3		
	or		
	– automatic disconnection of the supply		

Result: P = Pass F = Fail NA = Not Applicable

Clause Subclause	Requirement	Result	Comments
6.5.1	Protective earthing ACCESSIBLE conductive parts: — bonded to the protective conductor terminal or — separated by screen or BARRIER from parts which are HAZARDOUS LIVE (For indirect bonding of measurement and test equipment see 6.5.1.4)		
6.5.1.1	PROTECTIVE BONDING PROTECTIVE BONDING consists of directly connected structural parts or discrete conductors or both; and withstands thermal and dynamic stresses		
6.5.1.2 F	Bonding impedance of plug-connected equipment (see Form A.9)		
6.5.1.3 F	Bonding impedance of PERMANENTLY CONNECTED EQUIPMENT (see Form A.9)		
6.5.1.4 F	Indirect bonding for measuring and test equipment (see Form A.9)		
6.5.2	DOUBLE INSULATION and REINFORCED INSULATION (see 6.7, 6.8 and 6.9.2)		
6.5.3 F	PROTECTIVE IMPEDANCE (see Form A.10) Components wires and connections are RATED as required		
6.5.4 or (AM 2)	Built-in equipment (AM 1 only) Built-in panel meters If after building-in the requirements of 6.5.1 to 6.5.3 are not met: — equipment (AM 1 only): or (AM 2) — panel meter: — has no ACCESSIBLE conductive parts — has BASIC INSULATION of ACCESSIBLE surfaces — has DOUBLE/REINFORCED INSULATION of ACCESSIBLE surface of parts intended to be grasped		

Result: P = Pass F = Fail NA = Not Applicable

Clause Subclause	Requirement	Result	Comments
6.6	External circuits		
6.6.1	Separation of internal circuits (see list in Forms A.1 and A.5)		
F	If the other internal circuit exceeds the values of 6.3.2 in NORMAL CONDITION and only BASIC INSULATION:		
	a) short circuit could not make external circuit HAZARDOUS LIVE		
	b) manufacturer's instructions include:		
	– a statement that the TERMINAL for external circuits is for use only with equipment which has no live parts which are ACCESSIBLE		
	– the RATING of the insulation required for external circuits		
	– the connection to be used at the remote end of external circuits		
	– the type of equipment which may be connected to the TERMINAL		
6.6.2	TERMINALS for external circuits		
	ACCESSIBLE TERMINALS are not HAZARDOUS LIVE except as permitted by 6.1.1		
	The following TERMINALS are not HAZARDOUS LIVE:		
	– PROTECTIVE CONDUCTOR TERMINALS		
	– FUNCTIONAL EARTH TERMINALS		
	– headphone TERMINALS		
F	TERMINALS which receive a charge from an internal capacitor (see Form A.7)		
	High-voltage TERMINALS energized from the interior are:		
	– not accessible		
	or		
(AM 2)	– marked		