IEC 61010-2-061

Edition 3.0 2015-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

GROUP SAFETY PUBLICATION

PUBLICATION GROUPÉE DE SÉCURITÉ

Safety requirements for electrical equipment for measurement, control, and laboratory use –
Part 2-061: Particular requirements for laboratory atomic spectrometers with thermal atomization and ionization

Règles de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire –
Partie 2-061: Exigences particulières pour spectromètres atomiques de laboratoire avec vaporisation et ionisation thermique

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2-061: Particular requirements for laboratory atomic spectrometers with thermal atomization and ionization

FOREWORD

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International Standard IEC 61010-2-061 has been prepared by IEC technical committee 66: Safety of measuring, control and laboratory equipment.

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

This third edition cancels and replaces the second edition published in 2003. It constitutes a technical revision and includes the following change from the second edition:

- exclusion of equipment, whose size and weight make unintentional movement unlikely, from the drop test in Clause 8.
- notes have been re-phrased according to ISO/IEC Directives.

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The text of this standard is based on the following documents:

FDIS	Report on voting
66/553/FDIS	66/568/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.

A list of all parts of the IEC 61010 series, under the general title: *Safety requirements for electrical equipment for measurement, control, and laboratory use*, may be found on the IEC website.

This Part 2-061 is intended to be used in conjunction with IEC 61010-1. It was established on the basis of the third edition (2010).

This Part 2-061 supplements or modifies the corresponding clauses in IEC 61010-1 so as to convert that publication into the IEC standard: *Safety requirements for laboratory atomic spectrometers with thermal atomization and ionization.*

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” or “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 additional annexes are lettered starting from AA.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. 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 2-061: Particular requirements for laboratory atomic spectrometers with thermal atomization and ionization

Withdrawn

1 Scope and object

This clause of Part 1 is applicable except as follows:

1.1 Scope

1.1.1 Equipment included in scope

Replacement:

Replace the text by the following:

This part of IEC 61010 applies to electrically powered laboratory atomic spectrometers with thermal atomization.

NOTE 1 Examples include atomic absorption spectrometers, emission flame photometers, atomic fluorescence spectrophotometers, inductively coupled plasma spectrometers, microwave coupled plasma spectrometers and mass spectrometers, all with thermal atomization and ionization (including tubing and connectors which are provided by the manufacturer for connection to external supplies).

NOTE 2 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.

1.1.2 Equipment excluded from scope

Addition:

Add as the first paragraph:

This standard does not apply to thermal atomization detectors (flame ionization detectors) used in gas chromatography.

2 Normative references

This clause of Part 1 is applicable.

3 Terms and Definitions

This clause of Part 1 is applicable except as follows:

Additions:

Add the following definitions:

3.2.101
SPRAY CHAMBER
chamber in which droplets of sample in aerosol are allowed to separate so that the droplets of necessary size can be passed onward to the burner, with the remainder draining to waste

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3.2.102
GAS LOCK
device to allow drainage of waste sample liquid, and to prevent unintentional escape of gas from the SPRAY CHAMBER through its drain outlet

Note 1 to entry: See for example Figure 101.

3.5.101
FLASH-BACK
event during which the flame travels back through the burner with the result that the gas in the mixing chamber is caused to ignite.

4 Tests

This clause of Part 1 is applicable except as follows:

Addition:

Add the following subclauses:

4.4.2.101 Sampling probe tip

Any system designed to withdraw a sampling probe tip after sampling has been completed shall be overridden, so as to leave the tip in its most exposed position when a sample vessel is removed.

Exceptions:

The withdrawal system need not be overridden if the sampling probe:

a) cannot cause a HAZARD to the OPERATOR when it is exposed;

b) is designed in such a manner that no SINGLE FAULT CONDITION can cause the tip to remain exposed after sampling has been completed.

4.4.2.102 Failure, or partial failure, of the MAINS supply

The voltage of the power supply to the equipment from the MAINS supply shall first be reduced to just less than 90 % of the RATED voltage, and shall then be switched off.

5 Marking and documentation

This clause of Part 1 is applicable except as follows:

Addition:

Add the following subclause:

5.1.5.101 Gas and liquid connections

The following shall be unambiguously marked adjacent to the connector on the equipment (see 5.2):

a) the identity of the gas or liquid;

b) the maximum permitted pressure,

c) flow direction of the gas and liquid, if applicable.

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NOTE Such markings may be specific (for example acetylene, propane, water) or generic (for example fuel gas, oxidant gas, coolant, waste liquid).

Where no internationally recognized symbol (such as a chemical formula) exists, the equipment shall be marked with symbol 14 of Table 1 together with an unambiguous text in English. The documentation accompanying the equipment shall provide an adequate translation of this text (where it is required) in the language of the country in which it is to be installed, to assure that the installer or OPERATOR is able to connect the equipment correctly.

Conformity is checked by inspection.

5.2 Warning markings

Addition:

Add the following paragraph before the conformity statement:

Where hot gases or plasma emerge from equipment, the protective structure provided (for example a chimney, see 10.1), shall be clearly marked by symbol 13 of Table 1, to indicate where excessively hot temperatures may exist.

5.4.3 Equipment installation

Addition:

Add before the first paragraph the following new paragraph:

The documentation shall state that the RESPONSIBLE BODY shall ensure that the type of connector used at the outlet side of the gas-pressure regulator conforms to applicable national requirements;

Deletion:

Delete item f).

Addition:

Add, after item g) and before the note, the following new items:

aa) requirements for liquid connection;

bb) requirements for a fume extraction system to remove exhaust gases which may be hazardous. In the case of equipment using only a propane flame in a ventilated room, and when it is known that samples will not leave any hazardous residues, it is not necessary to provide an extraction system, since the exhaust gases from a propane flame will themselves not present any hazard.

cc) requirements for appropriate filtering or other systems which may be necessary to trap hazardous sample residues present in the exhaust gas stream;

dd) the documentation shall state that the RESPONSIBLE BODY shall carry out appropriate leakage tests necessary for safety on those gas and liquid connections which the OPERATOR is directed to assemble during installation, NORMAL USE, or maintenance;

ee) instructions for examining, during installation and maintenance, parts of the external gas supply system including tubing connected to the equipment, in order to confirm that their condition is satisfactory, for example to detect stress cracks. In addition any special national regulations for the safe use of gases and gas cylinders shall be observed.

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ff) instructions for necessary provisions for collection of waste from the SPRAY CHAMBER, including the requirements for any waste container which may be specified by the manufacturer;

gg) requirements for connection of the equipment to supplies of air, fuel gas (for example hydrogen, acetylene, or propane) and oxidant (for example oxygen or nitrous oxide). See also 11.103.

Add, after the existing note, the following new notes:

NOTE 101 Connections on the outlet side of gas regulators (from which tubing connects to the equipment) vary from country to country and are often covered by national regulations. Variations can include thread type, whether left-hand or right-hand, types of tubing and means of attachment.

NOTE 102 Warning markings are specified in 5.1.101, 5.1.5.2 c), 6.1.2 b), 7.3.2 b) 3), 7.4, 10.1, 13.2.2.

5.4.4 Equipment operation

Additions:

Add, after item j), the following new items:

aa) a reminder to the RESPONSIBLE BODY of the responsibility for the correct collection and disposal of waste materials, including the necessity for:

1) a suitably sized waste container of appropriately resistant material for the collection of organic solvent waste;

NOTE The proper disposal of waste materials is well documented by national authorities and it is these procedures supersede the requirements of this standard in regard of waste disposal. This part 2 should only bring to the attention of the OPERATOR that potentially hazardous waste materials are present and national (local) regulations for the proper disposal can apply.

2) provision for the removal into an appropriate exhaust system of any gases or vapours which may be produced in hazardous concentrations;

bb) a list of fluids known by the manufacturer to be potentially unsafe if used with the equipment.

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

Documentation shall also indicate that this list cannot be taken to be exhaustive and that, in case of uncertainty about a specific fluid, that fluid shall not be used until confirmation by the manufacturer that it will not present a HAZARD.

Add the following subclause:

5.4.4.101 Cleaning and decontamination

Documentation shall indicate:

a) that the RESPONSIBLE BODY has the responsibility for carrying out appropriate decontamination if hazardous material is spilt on or inside the equipment;

b) manufacturer's recommendations for cleaning and, where necessary, decontamination, together with the recognized generic names of recommended materials for cleaning and decontamination.

The following wording shall appear in the documentation:

“Before using any cleaning or decontamination methods except those specified by the manufacturer, the RESPONSIBLE BODY should check with the manufacturer that the proposed method will not damage the equipment.”

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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. Cleaning and decontamination shall be necessary as a safeguard when spectrometers and their accessories are maintained, repaired, or transferred. Manufacturers shall provide a format for the RESPONSIBLE BODY to certify that such a treatment has been carried out.

NOTE Information on decontaminants their use, dilution and potential application is contained in the *Laboratory Biosafety Manual*, published by the World Health Organization and the *Biosafety in Microbiological and Biomedical Laboratories*, published by Centers for Disease Control and Prevention and National Institutes of Health, Washington. There are also national guidelines that cover these areas.

Table 101 – Time-temperature conditions

Absolute pressure kPa	**Corresponding steam temperature**		**Minimum hold time** min
	Nominal °C	**Range** °C	
325	136,0	134 – 138	3
250	127,5	126 – 129	10
215	122,5	121 – 124	15
175	116,5	115 – 118	30
NOTE "Minimum hold time" means the time the contaminant is at the steam temperature.			

5.4.5 Equipment maintenance and service

Addition:

Add, after the first paragraph, the following new paragraph:

Instructions shall include any instructions for examination and tests which are to be carried out on parts and connections containing gases or liquids inside the equipment, in order to check that no leakage is occurring.

6 Protection against electric shock

This clause of Part 1 is applicable.

7 Protection against mechanical hazards

This clause of Part 1 is applicable.

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.*

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