

INTERNATIONAL STANDARD



**Safety requirements for electrical equipment for measurement, control
and laboratory use –
Part 2-202: Particular requirements for electrically operated valve actuators**

Document Preview

[IEC 61010-2-202:2020](#)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2-202: Particular requirements for electrically operated valve actuators

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 61020-2-202 has been prepared by committee TC 65: Industrial-process measurement, control and automation.

This second edition cancels and replaces the first 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) the scope has been clarified in relationship with other IEC standards,
- b) additional requirement for identification has been included,
- c) additional requirement for user documentations has been included,
- d) accuracy of high voltage di-electric tester has been specified,
- e) conformity statement for mechanical tests has been clarified.

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

FDIS	Report on voting
65/835/FDIS	65/844/RVD

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

This Part 2-202 is to be used in conjunction with third edition of IEC 61010-1:2010, including its Amendment 1:2016.

This Part 2-202 supplements or modifies the corresponding clauses in IEC 61010-1 so as to convert that publication into the IEC standard: *Particular requirements for electrically operated valve actuators*.

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", "replacement", or "deletion", the relevant requirement, test specification or note in Part 1 should be adapted accordingly.

A list of all parts in 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.

In this standard:

- 1) the following print types are used:
 - requirements: in roman type;
 - NOTES: in smaller 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. Additional annexes are lettered starting from AA.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

This IEC 61010-2-202 document constitutes Part 2-202 of a planned series of standards on industrial-process measurement, control and automation equipment.

Safety terms of general use are defined in IEC 61010-1. More specific terms are defined in each part.

This part incorporates the safety related requirements of electrically operated valve ACTUATORS and SOLENOIDS.

This document does not cover functional safety aspects of electrically operated ACTUATORS and SOLENOIDS.

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

Part 2-202: Particular requirements for electrically operated valve actuators

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 of the text by the following paragraphs:

This part of IEC 61010 specifies the safety requirements for electric ACTUATORS and SOLENOIDS, as applied to valves, intended to be installed in an industrial process or discrete control environment.

This part of IEC 61010 specifies:

- particular safety requirements for general purpose electrically operated valve ACTUATORS and SOLENOIDS,
- related verification tests.

~~The general purpose electrically operated valve ACTUATORS and SOLENOIDS, covered by this part of IEC 61010 are limited to:~~

~~— those rated 600 V alternative current/ 840 V direct current or less,~~

~~Service personnel interface to equipment included in the scope of this document.~~

1.1.2 Equipment excluded from scope

Addition at the end of the list:

This standard excludes:

- ~~— electric ACTUATORS and SOLENOIDS for use in explosive atmospheres, as covered by the IEC 60079 series of standards;~~
- ~~— mechanical parts/aspects of valves;~~
- ~~— ACTUATORS and SOLENOIDS performing a safety function as covered by the IEC 61508 series of standards;~~
- ~~— POSITIONERS.~~

aa) electric ACTUATORS and SOLENOIDS for use in domestic or commercial applications;

NOTE 1 These are covered by other IEC or ISO standards, such as IEC 60730, etc.

bb) electric ACTUATORS and SOLENOIDS performing a safety function;

NOTE 2 These are covered by other IEC or ISO standards, such as IEC 61508, etc.

cc) positioners.

NOTE 3 A positioner is defined as a "physical unit delivering an additional, often mechanical, feedback to a mechanical final controlling element that improves its velocity and precision" in IEC 60050-351:2013, 351-56-17.

1.2 Object

1.2.2 Aspects excluded from scope

Addition at the end of the list:

aa) mechanical parts/aspects of valves.

1.2.101 Aspects included in other applicable standards

Where electric ACTUATORS and SOLENOIDS are required to comply with requirements of other IEC or ISO standards, aspects fully covered in these standards can replace requirements as given in IEC 61010-1.

Where aspects covered in IEC 61010-1 are not fully covered in these IEC or ISO standards, tests of IEC 61010-1 shall be conducted as far to ensure that no HAZARD can occur in NORMAL or in SINGLE FAULT CONDITION.

NOTE IEC 61010-1:2010, Figure 15 of 14.1 gives a general overview of dealing with components within the scope of other IEC or ISO standards. A similar approach can be used for equipment and sub-assemblies. Example – Clauses 8 and 9.1 to 9.5 can generally be considered sufficiently covered where IEC 60079 has been applied.

2 Normative references

~~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.~~

This clause of Part 1 is applicable, ~~except as follows:~~ 2020

~~No additional references are needed for this document.~~

3 Terms and definitions

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

Additional terms and definitions:

~~3.101.1~~ 3.101

ACTUATOR

device that controls a valve ~~it is assembled to~~, in response to an external signal

~~3.101.2~~ 3.102

SERVICE PERSONNEL

person who is installing, changing or repairing the control equipment, with the appropriate technical training, experience and awareness of HAZARDS and of measures to minimize danger to ~~themselves~~ himself/herself, other persons or to the control equipment, in an industrial environment, ~~changing or repairing the control equipment~~

Note 1 to entry: SERVICE PERSONNEL are persons having the appropriate technical training and experiences necessary to be aware of HAZARDS – e.g, electrical HAZARDS, temperature HAZARDS, fire HAZARDS – to which they are exposed in performing a task and of measures to minimize danger to themselves or to other persons or to the control equipment, in an industrial environment.

Note 2 to entry: SERVICE PERSONNEL change or repair the control equipment e.g. hardware configuration or installing software updates provided by the manufacturer.

~~3.101.3~~ **3.103**

SOLENOID

~~cylindrical coil, the length of which is much greater than its transverse dimensions and which is used to produce a magnetic field~~

a coil, carrying current, to produce a magnetic field, in order to move a plunger

~~3.101.4~~

SWITCH

~~contact device actuated by the valve mechanism~~

4 Tests

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

4.4.2.1 General

Replacement of the first sentence with the following sentence:

Fault conditions shall include those specified in 4.4.2.2 to 4.4.2.14 and in 4.4.2.101.

4.4.2.5 Motors

Additional subclause:

4.4.2.5.101 Motor power supply

~~In actuators where the motor power supply can be wired incorrectly:~~

~~Delta-connected motor shall be connected to power supply with star connection.~~

~~Star-connected motor shall be connected to power supply with delta connection.~~

~~For a three-phase motor, any two phases shall be reverse connected.~~

In ACTUATORS where the motor power supply can be wired incorrectly:

- delta-connected motor shall be connected to power supply with star connection;
- star-connected motor shall be connected to power supply with delta connection;

Additional subclause:

4.4.2.101 SOLENOID

SOLENOID shall be ~~stopped~~ blocked while fully energized or prevented from moving, whichever is less favourable.

A SOLENOID damaged during one test may be repaired or replaced before the next test.

5 Marking and documentation

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

5.1.2 Identification

Addition of a new item to the list:

- aa) identification that this is a device for industrial process or discrete control environment applications, either through text, or identification of the safety standard.

NOTE Example: Text such as "IEC 61010" or similar can be considered as sufficient.

5.1.3 MAINS supply

Addition after e):

~~aa)~~

- ~~— number of phase conductors (e.g. 2,3);~~
- ~~— other designated conductors (e.g. N,M,PE).~~

aa) number of phases for multiphase connections (e.g. 2,3);

bb) other designated conductors (e.g. N, PE).

5.4 Documentation

~~This clause of IEC 61010-1 is applicable except as follows:~~

5.4.1 General

Addition of a new item to the list:

- aa) information that the device is constructed for industrial process or discrete control application.

5.4.2 Equipment RATINGS

Addition after f):

~~aa) — the maximum linear travel distance or rotation angle of the ACTUATOR;~~

~~bb) — the maximum force available from the ACTUATOR;~~

~~cc) — the minimum actuation cycles available.~~

aa) the maximum force or torque available from the ACTUATOR.

5.4.3 Equipment installation

Addition after g):

aa) instructions of how to install the equipment in order to ~~guarantee~~ achieve the stated degree of protection according to IEC 60529, shall be provided;

bb) instructions on the RATINGS of necessary equipment required to complete the installation of the ACTUATOR or SOLENOID so that it operates safely. This may include but is not limited to:

- contactors,
- ~~— stall protection~~
- locked rotor and overload protection,
- overcurrent devices,
- connection of thermal trips,
- isolators.

5.4.4 Equipment operation

Replacement of d):

~~d) — intermittent operation limits, e.g. energize ACTUATOR at least once per hour.~~