

INTERNATIONAL STANDARD



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

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INTERNATIONAL STANDARD



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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD.....	3
INTRODUCTION.....	6
1 Scope and object.....	7
2 Normative references	8
3 Terms and definitions	8
4 Tests	9
5 Marking and documentation.....	9
6 Protection against electric shock	11
7 Protection against mechanical HAZARDS.....	11
8 Resistance to mechanical stresses	12
9 Protection against the spread of fire	12
10 Equipment temperature limits and resistance to heat.....	12
11 Protection against HAZARDS from fluids and solid foreign objects	12
12 Protection against radiation, including laser sources, and against sonic and ultrasonic pressure	12
13 Protection against liberated gases and substances, explosion and implosion	12
14 Components and subassemblies	13
15 Protection by interlocks	13
16 HAZARDS resulting from application	13
17 RISK assessment	13
Annexes	14
Bibliography.....	15

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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

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 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 IEC National Committees.
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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

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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.

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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:~~

~~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.~~

Addition after j):

- aa) duty cycle, if the device is designed for intermittent operation;
- bb) instructions for safety protection relating to surface temperature.

5.4.5 Equipment maintenance and service

Addition of the following paragraph after the last paragraph before the conformity statement:

If more than one disconnect switch may be required to disconnect all power within an ACTUATOR, the manufacturer shall provide instructions with the word "warning" and the following or the equivalent: "risk of electric shock – more than one disconnect switch may be required to de-energize the device for servicing."

6 Protection against electric shock

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

6.1.2 Exceptions

Addition of the following paragraph after the conformity statement:

HAZARDOUS LIVE parts, components or subassemblies can be ~~be touched~~ ACCESSIBLE by SERVICE PERSONNEL during service provided that they are marked with symbol 12 of Table 1 to indicate an electric shock HAZARD.

6.8.3.1 The a.c. voltage test

Replacement of the first sentence by the following sentence:

The voltage tester shall be capable of maintaining the test voltage throughout the test within +/- 5 % of the specified value.

7 Protection against mechanical HAZARDS

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

7.3 Moving parts

Additional subclause:

7.3.101 Independence of operating wheels and transmission gears

If a mechanical operating wheel, etc. is supplied or specified by the ACTUATOR manufacturer, it shall not cause a HAZARD in NORMAL or SINGLE FAULT CONDITIONS, while the ACTUATOR is operated.

No ACCESSIBLE moving parts of the ACTUATOR assembly shall create a HAZARD when the ACTUATOR is operated.

If these conditions are not met, a RISK assessment shall be carried out according to 7.3.3 or Clause 17.

Conformity is checked by inspection.

7.5.1 General

Addition of the following paragraph before the conformity statement:

Lifting and carrying through strapping is allowed. Lifting and carrying through strapping the operating wheel is not allowed.

8 Resistance to mechanical stresses

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

8.1 General

Addition of the following before the conformity statement:

Components complying with suitable component standard, where impact test is included, does not have to be retested in the end application. Also see 14.1 and Figure 15.

Addition of the following at the end of the conformity statement:

Where the ACTUATOR or SOLENOID and valve are inseparable, the pressure containing parts shall be tested as follows after mechanical tests:

- leakage per 11.7.2 at 1,3 times RATED pressure for 2 min; or
- leakage per 11.7.3 at 1,1 times RATED pressure for 2 min; or
- relevant valve standard as per 14.102, if more severe.

NOTE For inseparable assemblies, see Clause 14.

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 and solid foreign objects

This clause of Part 1 is applicable.

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.

14 Components and subassemblies

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

Additional subclauses:

14.101 SOLENOID

The bobbins of the SOLENOID shall be made of material with a flammability classification of V-1 of IEC 60695-11-10 or better.

Insulating material or insulating bushing of the SOLENOID shall be made of material with a flammability classification of V-1 of IEC 60695-11-10 or better.

This requirement does not apply to SOLENOIDS which are only to be supplied from limited-energy circuits meeting the requirements of 9.4, or for SOLENOIDS used in equipment additionally in compliance with IEC 60079 (all parts).

Conformity is checked by inspection of data on materials, or by performing the vertical burning tests specified in IEC 60695-11-10 on three samples of the material used in the relevant parts.

14.102 Inseparable valve ACTUATOR assemblies

Where an electrical ACTUATOR is part of an inseparable assembly containing both the ACTUATOR and a mechanical valve, the valve assembly shall meet the relevant valve safety standards.

15 Protection by interlocks

This clause of Part 1 is applicable.

16 HAZARDS resulting from application

This clause of Part 1 is applicable.

17 Risk assessment

This clause of Part 1 is applicable.

Annexes

All annexes of Part 1 are applicable.

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Bibliography

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

Addition:

~~[1] — UL 429-2009, *UL Standard for Safety for Electrically Operated Valves*~~

~~[2] — UL 969, *UL Standard for Safety for Marking and Labeling Systems*~~

[3] IEC 60050-351:2013, *International electrotechnical vocabulary (IEV) – Part 351: Control technology*

IEC 60730 (all parts), *Automatic electrical controls*

IEC 60730-2-8:2018, *Automatic electrical controls – Part 2-8: Particular requirements for electrically operated water valves, including mechanical requirements*

IEC 60730-2-14:2017, *Automatic electrical controls – Part 2-14: Particular requirements for electric actuators*

ISO 22153:2020, *Electric actuators for industrial valves – General requirements*

CAN/CSA C22.2 No 139, *Electrically operated valves*

UL 429, *UL Standard for Safety for Electrically Operated Valves*

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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

**Exigences de sécurité pour appareils électriques de mesurage, de régulation
et de laboratoire –**

**Partie 2-202: Exigences particulières pour les actionneurs à vanne à commande
électrique**

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CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope and object.....	6
2 Normative references	7
3 Terms and definitions	7
4 Tests	7
5 Marking and documentation.....	8
6 Protection against electric shock	9
7 Protection against mechanical HAZARDS.....	9
8 Resistance to mechanical stresses	10
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15 Protection by interlocks	11
16 HAZARDS resulting from application	11
17 RISK assessment	11
Annexes	12
Bibliography.....	13

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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

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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

This clause of Part 1 is applicable.

3 Terms and definitions

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

Additional terms and definitions:

3.101

ACTUATOR

device that controls a valve, in response to an external signal

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 himself/herself, other persons or to the control equipment, in an industrial environment

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.

3.103

SOLENOID

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

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;

Additional subclause:

4.4.2.101 SOLENOID

SOLENOID shall be 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 phases for multiphase connections (e.g. 2,3);
bb) other designated conductors (e.g. N, PE).

5.4 Documentation

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 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 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,
 - locked rotor and overload protection,
 - overcurrent devices,

- connection of thermal trips,
- isolators.

5.4.4 Equipment operation

Addition after j):

- aa) duty cycle, if the device is designed for intermittent operation;
- bb) instructions for safety protection relating to surface temperature.

5.4.5 Equipment maintenance and service

Addition of the following paragraph after the last paragraph before the conformity statement:

If more than one disconnect switch may be required to disconnect all power within an ACTUATOR, the manufacturer shall provide instructions with the word "warning" and the following or the equivalent: "risk of electric shock – more than one disconnect switch may be required to de-energize the device for servicing."

6 Protection against electric shock

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

6.1.2 Exceptions

Addition of the following paragraph after the conformity statement:

HAZARDOUS LIVE parts, components or subassemblies can be ACCESSIBLE by SERVICE PERSONNEL during service provided that they are marked with symbol 12 of Table 1 to indicate an electric shock HAZARD.

6.8.3.1 The a.c. voltage test

Replacement of the first sentence by the following sentence:

The voltage tester shall be capable of maintaining the test voltage throughout the test within +/- 5 % of the specified value.

7 Protection against mechanical HAZARDS

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

7.3 Moving parts

Additional subclause:

7.3.101 Independence of operating wheels and transmission gears

If a mechanical operating wheel, etc. is supplied or specified by the ACTUATOR manufacturer, it shall not cause a HAZARD in NORMAL or SINGLE FAULT CONDITIONS, while the ACTUATOR is operated.

No ACCESSIBLE moving parts of the ACTUATOR assembly shall create a HAZARD when the ACTUATOR is operated.

If these conditions are not met, a RISK assessment shall be carried out according to 7.3.3 or Clause 17.

Conformity is checked by inspection.

7.5.1 General

Addition of the following paragraph before the conformity statement:

Lifting and carrying through strapping is allowed. Lifting and carrying through strapping the operating wheel is not allowed.

8 Resistance to mechanical stresses

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

8.1 General

Addition of the following before the conformity statement:

Components complying with suitable component standard, where impact test is included, does not have to be retested in the end application. Also see 14.1 and Figure 15.

Addition of the following at the end of the conformity statement:

Where the ACTUATOR or SOLENOID and valve are inseparable, the pressure containing parts shall be tested as follows after mechanical tests:

- leakage per 11.7.2 at 1,3 times RATED pressure for 2 min; or
- leakage per 11.7.3 at 1,1 times RATED pressure for 2 min; or
- relevant valve standard as per 14.102, if more severe.

NOTE For inseparable assemblies, see Clause 14.

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 and solid foreign objects

This clause of Part 1 is applicable.

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.

14 Components and subassemblies

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

Additional subclauses:

14.101 SOLENOID

The bobbins of the SOLENOID shall be made of material with a flammability classification of V-1 of IEC 60695-11-10 or better.

Insulating material or insulating bushing of the SOLENOID shall be made of material with a flammability classification of V-1 of IEC 60695-11-10 or better.

This requirement does not apply to SOLENOIDS which are only to be supplied from limited-energy circuits meeting the requirements of 9.4, or for SOLENOIDS used in equipment additionally in compliance with IEC 60079 (all parts).

Conformity is checked by inspection of data on materials, or by performing the vertical burning tests specified in IEC 60695-11-10 on three samples of the material used in the relevant parts.

14.102 Inseparable valve ACTUATOR assemblies

Where an electrical ACTUATOR is part of an inseparable assembly containing both the ACTUATOR and a mechanical valve, the valve assembly shall meet the relevant valve safety standards.

15 Protection by interlocks

This clause of Part 1 is applicable.

16 HAZARDS resulting from application

This clause of Part 1 is applicable.

17 Risk assessment

This clause of Part 1 is applicable.

Annexes

All annexes of Part 1 are applicable.

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Bibliography

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

Addition:

IEC 60050-351:2013, *International electrotechnical vocabulary (IEV) – Part 351: Control technology*

IEC 60730 (all parts), *Automatic electrical controls*

IEC 60730-2-8:2018, *Automatic electrical controls – Part 2-8: Particular requirements for electrically operated water valves, including mechanical requirements*

IEC 60730-2-14:2017, *Automatic electrical controls – Part 2-14: Particular requirements for electric actuators*

ISO 22153:2020, *Electric actuators for industrial valves – General requirements*

CAN/CSA C22.2 No 139, *Electrically operated valves*

UL 429, *UL Standard for Safety for Electrically Operated Valves*

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SOMMAIRE

AVANT-PROPOS.....	15
INTRODUCTION.....	17
1 Domaine d'application et objet.....	18
2 Références normatives.....	19
3 Termes et définitions.....	19
4 Essais.....	19
5 Marquage et documentation.....	20
6 Protection contre les chocs électriques.....	21
7 Protection contre les DANGERS mécaniques.....	22
8 Résistance aux contraintes mécaniques.....	22
9 Protection contre la propagation du feu.....	22
10 Limites de température de l'appareil et résistance à la chaleur.....	23
11 Protection contre les DANGERS des fluides et des corps solides étrangers.....	23
12 Protection contre les radiations, y compris les sources laser, et contre la pression acoustique et ultrasonique.....	23
13 Protection contre les émissions de gaz et substances, les explosions et les implosions.....	23
14 Composants et sous-ensembles.....	23
15 Protection par systèmes de verrouillage.....	23
16 DANGERS résultant de l'application.....	24
17 Appréciation du RISQUE.....	24
Annexes.....	25
Bibliographie.....	26

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

**EXIGENCES DE SÉCURITÉ POUR APPAREILS ÉLECTRIQUES
DE MESURAGE, DE REGULATION ET DE LABORATOIRE –****Partie 2-202: Exigences particulières
pour les actionneurs à vanne à commande électrique**

AVANT-PROPOS

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La Norme internationale IEC 61020-2-202 a été établie par le CE 65: Mesure, commande et automation dans les processus industriels.

Cette deuxième édition annule et remplace la première édition parue en 2016. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) le domaine d'application a été clarifié en relation avec d'autres normes IEC,
- b) une exigence supplémentaire relative à l'identification a été ajoutée,

- c) une exigence supplémentaire relative aux documentations utilisateur a été ajoutée,
- d) l'exactitude du générateur de haute tension diélectrique a été spécifiée,
- e) la déclaration de conformité pour les essais mécaniques a été clarifiée.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
65/835/FDIS	65/844/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

La présente partie 2-202 doit être utilisée conjointement avec la troisième édition de l'IEC 61010-1:2010, y compris son amendement 1:2016.

La présente partie 2-202 complète ou modifie les articles correspondants de l'IEC 61010-1 de façon à transformer cette publication en norme IEC: *Exigences particulières pour les actionneurs à vanne à commande électrique*

Lorsqu'un paragraphe particulier de la Partie 1 n'est pas mentionné dans cette partie 2, ce paragraphe s'applique dans la mesure du raisonnable. Lorsque la présente partie spécifie "addition", "modification", "remplacement" ou "suppression", il convient d'adapter en conséquence l'exigence, la modalité d'essai ou la note correspondante de la Partie 1.

Une liste de toutes les parties de la série IEC 61010, publiées sous le titre général *Exigences de sécurité pour appareils électriques de mesure, de régulation et de laboratoire*, peut être consultée sur le site web de l'IEC.

Dans la présente norme:

- 1) les caractères d'imprimerie suivants sont utilisés:
 - exigences proprement dites: caractères romains;
 - NOTES: petits caractères romains;
 - conformité et essai: *caractères italiques*;
 - termes définis à l'Article 3 et utilisés dans toute cette norme: PETITES MAJUSCULES EN CARACTÈRES ROMAINS;
- 2) les paragraphes, figures, tableaux et notes qui s'ajoutent à ceux de la Partie 1 sont numérotés à partir de 101. Les annexes supplémentaires sont numérotées à partir de AA.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

INTRODUCTION

Le présent document IEC 61010-2-202 constitue la Partie 2-202 d'une série de normes planifiées sur les appareils de mesure, commande et automation dans les processus industriels.

Les termes de sécurité d'usage général sont définis dans l'IEC 61010-1. Des termes plus spécifiques sont définis dans chaque partie.

Cette partie contient les exigences relatives à la sécurité des ACTIONNEURS et SOLENOÏDES à vanne à commande électrique.

Le présent document ne couvre pas les aspects de sécurité fonctionnelle des ACTIONNEURS et SOLENOÏDES à commande électrique.

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EXIGENCES DE SÉCURITÉ POUR APPAREILS ÉLECTRIQUES DE MESURAGE, DE REGULATION ET DE LABORATOIRE –

Partie 2-202: Exigences particulières pour les actionneurs à vanne à commande électrique

1 Domaine d'application et objet

L'article de la Partie 1 s'applique avec l'exception suivante:

1.1 Domaine d'application

1.1.1 Appareils inclus dans le domaine d'application

Remplacer le texte par les alinéas suivants:

La présente partie de l'IEC 61010 spécifie les exigences de sécurité relatives aux ACTIONNEURS et SOLENOÏDES électriques, telles qu'appliquées aux vannes, destinés à être installés dans un environnement de processus industriel ou de commande discrète.

La présente partie de l'IEC 61010 spécifie:

- les exigences de sécurité particulières des ACTIONNEURS et SOLENOÏDES à vanne à commande électrique à usage général,
- les essais de vérification associés.

1.1.2 Appareils exclus du domaine d'application

Ajouter à la fin de la liste:

La présente norme exclut:

- aa) les ACTIONNEURS et SOLENOÏDES électriques utilisés dans des applications domestiques ou commerciales;

NOTE 1 Ces éléments sont couverts par d'autres normes IEC ou ISO, comme l'IEC 60730, etc.

- bb) les ACTIONNEURS et SOLENOÏDES électriques réalisant une fonction de sécurité;

NOTE 2 Ces éléments sont couverts par d'autres normes IEC ou ISO, comme l'IEC 61508, etc.

- cc) les positionneurs.

NOTE 3 Un positionneur est défini comme étant une "unité physique qui délivre un retour additionnel, souvent mécanique, à un élément de commande final mécanique qui améliore sa vitesse et précision" dans l'IEC 60050-351:2013, 351-56-17.

1.2 Objet

1.2.2 Aspects exclus du domaine d'application

Ajouter à la fin de la liste:

- aa) les parties/aspects mécaniques des vannes.

1.2.101 Aspects inclus dans d'autres normes applicables

Lorsque la conformité des ACTIONNEURS ET SOLENOÏDES électriques aux exigences d'autres normes IEC ou ISO est exigée, les aspects entièrement couverts dans ces normes peuvent remplacer les exigences de l'IEC 61010-1.

Lorsque les aspects couverts dans l'IEC 61010-1 ne sont pas entièrement couverts dans ces normes IEC ou ISO, les essais de l'IEC 61010-1 doivent être effectués de manière à assurer qu'aucun danger ne puisse se produire en CONDITIONS NORMALES ou en CONDITIONS DE PREMIER DÉFAUT.

NOTE La Figure 15 en 14.1 de l'IEC 61010-1:2010 donne un aperçu général de la façon de traiter les composants relevant du domaine d'application d'autres normes IEC ou ISO. Une approche similaire peut être utilisée pour les appareils et les sous-ensembles. Exemple - Les Articles 8 et 9.1 à 9.5 peuvent généralement être considérés comme suffisamment couverts lorsque la norme IEC 60079 a été appliquée.

2 Références normatives

L'article de la Partie 1 s'applique.

3 Termes et définitions

L'article de la Partie 1 s'applique avec l'exception suivante.

Termes et définitions complémentaires:

3.101

ACTIONNEUR

dispositif qui commande une vanne en réponse à un signal extérieur

3.102

PERSONNEL DE MAINTENANCE

personne qui installe, modifie ou répare l'appareil de commande, qui a une formation technique appropriée et l'expérience nécessaire pour être consciente des DANGERS et des mesures à prendre pour réduire le plus possible les dangers pour elle-même, pour d'autres personnes ou pour l'appareil de commande, dans un environnement industriel

Note 1 à l'article: Le PERSONNEL DE MAINTENANCE regroupe des personnes ayant une formation technique appropriée et l'expérience nécessaire pour être conscientes des DANGERS, par exemple les DANGERS électriques, les DANGERS liés à la température et les DANGERS liés au feu, auxquels elles sont exposées lors de la réalisation d'une tâche, et des mesures pour réduire le plus possible ces dangers pour elles-mêmes ou pour d'autres personnes ou pour l'appareil de commande, dans un environnement industriel.

Note 2 à l'article: Le PERSONNEL DE MAINTENANCE modifie ou répare l'appareil de commande, par exemple en configurant le matériel ou en installant des mises à jour de logiciels fournies par le fabricant.

3.103

SOLENOÏDE

bobine parcourue par un courant pour produire un champ magnétique afin de mettre en mouvement un piston

4 Essais

L'article de la Partie 1 s'applique avec les exceptions suivantes:

4.4.2.1 Généralités

Remplacer la première phrase par la phrase suivante: