

INTERNATIONAL STANDARD



**Household and similar electrical appliances – Safety –
Part 2-103: Particular requirements for drives for gates, doors and windows**

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Part 2-103: Particular requirements for drives for gates, doors and windows

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-103: Particular requirements for drives for gates, doors and windows

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.
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This commented version (CMV) of the official standard IEC 60335-2-103:2023 edition 4.0 allows the user to identify the changes made to the previous IEC 60335-2-103:2015+AMD1:2017+AMD2:2019 CSV edition 3.2. Furthermore, comments from IEC TC 61 experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 60335-2-103 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2015, Amendment 1:2017 and Amendment 2:2019. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the text has been aligned with IEC 60335-1:2020;
- b) scope includes DC-supplied appliances and battery-operated appliances (Clause 1);
- c) some notes have been converted to normative text (Clause 1);
- d) additional requirements for installation instructions have been incorporated (7.12);
- e) application of test probe 18 and test probe 19 have been introduced (8.1.1, 20.2, Annexes BB, CC and DD);
- f) addition of surface temperatures for external accessible surfaces (11.3, 11.8);
- g) requirements for loading accessible appliance outlets and socket outlets have been added (11.7);
- h) requirements for appliances incorporating integral batteries or separable batteries have been added (11.7);
- i) requirements have been added for drives intended for permanent connection delivered with a connector to ease the installation (22.108, 24.101, 25.3).

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

Draft	Report on voting
61/7017/FDIS	61/7082/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 60335 series, under the general title: *Household and similar electrical appliances – Safety*, can be found on the IEC website.

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments unless that edition precludes it; in that case, the latest edition that does not preclude it is used. It was established on the basis of the sixth edition (2020) of that standard.

NOTE 1 When "Part 1" is mentioned in this standard, it refers to IEC 60335-1.

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for drives for gates, doors and windows.

When a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

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

- reconfirmed,
- withdrawn, or
- revised.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations can need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 supporting documents on the IEC website

<https://www.iec.ch/tc61/supportingdocuments>

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules ~~may~~ can differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another part 2 of IEC 60335, the relevant part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

When a part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

NOTE 2 ~~Horizontal and generic standards~~ Horizontal publications, basic safety publications and group safety publications covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. ~~For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.~~ 1

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters. 2

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-103: Particular requirements for drives for gates, doors and windows

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric **drives** for horizontally and vertically moving gates, doors, garage doors and **windows** for household and similar purposes, their **rated voltage** being not more than 250 V for single-phase **drives** and 600 V for other **drives** including direct current (DC) supplied appliances and **battery-operated appliances** **3**. It also covers the hazards associated with the movement of the **driven part**.

~~Battery-operated drives and other d.c. supplied drives are within the scope of this standard. Dual supply drives, either mains-supplied or battery-operated, are regarded as battery-operated drives when operated in the battery mode.~~

Drives not intended for normal household use but which nevertheless ~~may~~ can be a source of danger to the public, such as **drives** intended to be used by laymen in shops, offices, hotels, restaurants, hospitals, in industry and on farms, are within the scope of this standard.

Requirements for **drives** for doors that ~~may~~ can be used in emergency routes and exits are given in **normative** Annex AA.

~~NOTE 101~~ Examples of **drives** within the scope of this standard are **drives** for

- folding doors;
- revolving doors;
- rolling doors;
- roof **windows**;
- sectional overhead doors;
- swinging and sliding gates or doors.

NOTE 101 Examples are shown in Figure 101.

NOTE 102 **Drives** ~~may~~ can be supplied with a **driven part**.

As far as is practicable, this standard deals with the common hazards presented by **drives** that are encountered by all persons in and around the home. However, in general, it does not take into account

- persons (including children) whose
 - physical, sensory or mental capabilities; or
 - lack of experience and knowledgeprevents them from using the **drive** safely without supervision or instruction;
- children playing with the **drive**.

~~NOTE 103~~ For appliances intended to be used in vehicles or on board ships or aircraft, additional requirements can be necessary. ~~Attention is drawn to the fact that~~ In many countries, additional

requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities **4** and similar authorities.

~~NOTE 104~~—This standard does not apply to **drives**

- for vertically moving garage doors for residential use (60335-2-95);
- for shutters covering doors and **windows** (including locations where the door is set back from the shutter), awnings, blinds and similar equipment (60335-2-97);
- intended exclusively to be used by trained persons in commercial and industrial premises;
- for specific purposes, such as fire doors;
- for natural smoke exhaust ventilators not used as **windows** (ISO 21927-2);
- intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas).

~~NOTE 105~~—This standard does not apply to movement of a pedestrian door where such movement is based solely on stored energy.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60068-2-52:2017, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium, chloride solution)*

IEC 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

IEC 60825-1:2014, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 61496-3:2008/2018, *Safety of machinery – Electro-sensitive protective equipment – Part 3: Particular requirements for active opto-electronic protective devices responsive to diffuse reflection (AOPDDR)*

IEC 61984:2008, *Connectors – Safety requirements and tests*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.9 ~~Replacement~~ Modification:

Replace the first paragraph with the following: **5**

~~normal operation~~

operation of the **drive** under the following conditions:

- **drives** supplied without a **driven part** are operated with their **rated load**;
- **drives** supplied with a **driven part** are operated with the **driven part** installed in accordance with the instructions

3.4041.101

rated load

force or torque assigned to the **drive** by the manufacturer

3.4051.102

rated operating time

duration of continuous operation assigned to the **drive** by the manufacturer

Note 1 to entry: During continuous operation, the **drive** may reverse its direction.

3.4061.103

rated number of operating cycles

number of uninterrupted **cycles** assigned to the **drive** by the manufacturer

3.5 Definitions relating to types of appliances

3.5.101

drive

motor and other components that control the movement of the **driven part**

Note 1 to entry: Examples of components are gears, controls, brakes, components for power transmission from the **drive** to the **driven part** and **entrapment protection systems**.

3.4105.102

automatic drive

drive that operates the **driven part** in at least one direction without intentional activation by the user

3.4125.103

reversible drive

drive that can be manually operated with or without power in both directions by manual action on the **driven part**

3.7 Definitions relating to safety components

3.4087.101

entrapment protection system

part of the **drive** that protects against crushing

Note 1 to entry: An **entrapment protection system** may consist of one or more devices, such as pressure sensitive edges, passive infrared and active light sensing devices, **biased-off switches** or motor current monitoring devices.

Note 2 to entry: An **entrapment protection system** may be incorporated in the motor assembly or installed separately.

3.4097.102

biased-off switch

hold to run device that initiates and maintains the **drive** movement only as long as the manual control is actuated by the user

3.8 Definitions relating to miscellaneous matters

3.4028.101

driven part

part of a gate, door, garage door or **window** that is intended to be moved by the **drive**

3.4038.102

window

part in a building that opens and closes in order to regulate the air and light and that is not intended for passage

3.1078.103

cycle

complete opening and closing movement of the **driven part**

Note 1 to entry: For revolving doors, a **cycle** means the necessary rotation to allow a person to pass through it.

3.1118.104

horizontally moving pedestrian door

swinging, sliding or rotating door designed for pedestrian use

3.1138.105

main closing edge

edge(s) of a pedestrian door leaf, whose distance from a parallel **opposing closing edge** or surface determines the usable pathway

3.1148.106

opposing closing edge

edge(s) of a pedestrian door leaf formed by the **main closing edge** and a fixed edge or a surface against which the pedestrian door leaf is moving

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.2 Addition:

When a test has to be carried out with a **driven part**, the **driven part** specified for installation with the **drive** that gives the most unfavourable conditions for the test is used. The **drive** is adjusted in accordance with the instructions.

The **driven part** may be simulated by an artificial load.

5.5 Addition:

A wicket door is kept:

- in the fully closed position if it travels together with the door during the tests, or
- in the fully open position or completely removed position if it does not travel with the door during the tests.

5.7 Addition:

If the **drive** is marked with an ambient temperature beyond the range of +5 °C to +40 °C, the tests of Clauses 11, 13, BB.20.10110, BB.20.1055, BB.20.1066, BB.20.1077, BB.20.1099, CC.20.1033, CC.20.1044, CC.20.1055, CC.20.1066, DD.20.1055, DD.20.1066, DD.20.1077, DD.20.1088, and Clause 21 are carried out at the most unfavourable marked temperature.

5.101 Drives shall be tested for compliance with this standard for any of the following modes of operation as intended by the manufacturer:

- automatic operation (operation in at least one direction without intentional activation by the user);

- *impulse activation (operation in either direction with an intentional activation by the user);*
- *biased-off (hold to run) operation.*

Whenever required by the instructions, components shall be added or changed to perform the tests.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Modification:

Replace the first paragraph with the following:

Drives shall be **class I**, **class II** or **class III**.

6.2 Addition:

Drives, or parts of **drives**, that are intended for exposure to outdoor conditions shall be at least IPX4.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

Drives shall be marked with their ambient temperature range.

Drives supplied without a **driven part** shall be marked with the **rated load**, in newtons (N) or in newton-metres (Nm).

Unless the **drive** is intended for continuous operation, **drives** supplied without a **driven part** shall be marked with the **rated operating time** in minutes, or the number of **cycles** per hour, or the **rated number of operating cycles**.

Drives supplied with a **driven part** shall be marked with the **rated number of operating cycles** or the **cycles** per hour, unless the **drive** is intended for continuous operation.

7.6 Addition:



[symbol ISO 7000-0533
(2004-01)]

upper limit of temperature



[symbol ISO 7000-0534
(2004-01)]

lower limit of temperature

7.12 Addition:

The instructions shall state the substance of the following: