

# INTERNATIONAL STANDARD



**Household and similar electrical appliances – Safety –  
Part 2-97: Particular requirements for drives for shutters, awnings, blinds and  
similar equipment**



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IEC 60335-2-97

Edition 4.0 2023-12  
COMMENTED VERSION

# INTERNATIONAL STANDARD



**Household and similar electrical appliances – Safety –  
Part 2-97: Particular requirements for drives for shutters, awnings, blinds and  
similar equipment**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 29.120.01, 91.060.50

ISBN 978-2-8322-8057-7

**Warning! Make sure that you obtained this publication from an authorized distributor.**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

#### Part 2-97: Particular requirements for drives for shutters, awnings, blinds and similar equipment

#### FOREWORD

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**This commented version (CMV) of the official standard IEC 60335-2-97:2023 edition 4.0 allows the user to identify the changes made to the previous IEC 60335-2-97:2016+AMD1:2019 CSV edition 3.1. 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 60335-2-97 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 2016 and Amendment 1: 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, 5.10, 20.101, 20.103);
- d) use of artificial loads is introduced (5.10);
- e) application of test probe 19 has been introduced (8.1.1, 20.2);
- f) addition of surface temperatures for external accessible surfaces (11.3, 11.8);
- g) requirements are added for drives intended for permanent connection delivered with a connector to ease the installation (22.102, 24.1.101, 25.3);
- h) clarification for connectors that are non-detachable once engaged (24.1.5).
- i) added requirements for instructions for parts of class III construction supplied from a detachable power supply part (7.12, 7.12.1).

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

| Draft        | Report on voting |
|--------------|------------------|
| 61/7016/FDIS | 61/7081/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/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 shutters, awnings, blinds and similar equipment.

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](http://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 ~~drive~~ appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of ~~drives~~ 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 2-97: Particular requirements for drives for shutters, awnings, blinds and similar equipment

#### 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 shutters, blinds and awnings, intended for household and similar purposes, their **rated voltage** being not more than 250 V for single-phase **drives** and 480 V for other **drives**, including direct current (DC) supplied appliances and **battery-operated appliances**. **3**

~~NOTE 101 – Battery-operated drives and other d.c. supplied drives are within the scope of this standard.~~

~~NOTE 102 – Examples of equipment that can be driven are~~

- spring controlled folding arm awnings;
- curtains;
- grilles covering doors and windows;
- projection screens;
- shutters covering doors and windows;
- draperies.

Examples are shown in Figure 101.

~~NOTE 103 – Drives may~~ can be supplied with a **driven part**.

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

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 104 – Attention is drawn to the fact that~~ For **drives** appliances intended to be used in vehicles or on board ships or aircraft, additional requirements ~~may~~ can be necessary. 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 and similar authorities.

~~NOTE 105 – This standard does not apply to~~

- **drives** intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);
- **drives** for vertically moving garage doors for residential use (IEC 60335-2-95);
- **drives** for gates, doors and windows (IEC 60335-2-103);
- **drives** used in premises such as hangars or in heavy industry;
- **drives** for theatre curtains.

## 2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60068-2-52:1996/2017, *Environmental testing – Part 2: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

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

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: **4**

#### ~~normal operation~~

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

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

#### ~~3.103~~ 1.101

##### **rated load**

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

#### ~~3.104~~ 1.102

##### **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.

#### ~~3.105~~ 1.103

##### **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 and components for power transmission from the **drive** to the **driven part**.

### 3.7 Definitions relating to safety components

#### ~~3.106~~ 3.101

##### **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

#### ~~3.102~~ 3.101

##### **driven part**

movable part, such as a shutter, awning or blind, that is operated by the **drive**

## 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.

#### 5.10 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.*

*When the **drive** is supplied with the **driven part**, the **driven part** may be simulated by an artificial load, except for the tests of 20.104.1, 20.104.2, 20.104.3, 20.104.4 and 20.104.5.*

*When the **drive** is supplied without the **driven part**, the **driven part** shall be simulated by an artificial load or a representative **driven part** considering the manufacturer instructions to represent the most unfavourable conditions, except for the tests of 20.104.1, 20.104.2, 20.104.3, 20.104.4 and 20.104.5. **5***

*The tests of 20.104.1, 20.104.2, 20.104.3, 20.104.4 and 20.104.5 shall be carried out with the supplied **driven part**, or a representative **driven part** considering the manufacturer instructions to represent the most unfavourable conditions.*

~~NOTE 101~~ An example of an artificial load for rolling **driven parts** is in Figure 102.

## 6 Classification

This clause of Part 1 is applicable except as follows.

#### 6.2 Addition:

**Drives** or parts of **drives** exposed to outdoor conditions shall be at least IPX4.

When **driven parts** are exposed to outdoor conditions, **drives** or parts of **drives** covered by the **driven part** shall be at least IPX4.

## 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

### 7.1 Addition:

**Drives** supplied without a **driven part** shall be marked with

- the **rated load**, in newtons (N) or in newton-metres (Nm);
- the **rated operating time**, in minutes, unless the **drive** is intended for continuous operation.

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

### 7.12 Modification:

Replace the fifth paragraph with the following:

The instructions for appliances having a part of **class III construction** supplied from a **detachable power supply part** shall state that the appliance is only to be used with the power supply provided with the appliance or the **detachable power supply part** listed in the instructions. **6**

#### Addition:

The instructions for **drives** supplied with a **driven part** shall state that the **rated number of operating cycles** is not to be exceeded.

The instructions shall state the substance of the following:

WARNING: Important safety instructions. It is important for the safety of persons to follow these instructions. Save these instructions.

The instructions shall include the substance of the following where applicable:

- do not allow children to play with fixed controls. Keep remote controls away from children;
- frequently examine the installation for imbalance and signs of wear or damage to cables springs and fixings. Do not use if repair or adjustment is necessary;
- ~~– details on how to use any manual release;~~
- when operating a biased-off switch, make sure that other persons are kept away;
- do not operate when maintenance, such as window cleaning, is being carried out in the vicinity.

The instructions shall include details on how to use the manual release if applicable. **7**

The instructions for automatically controlled **drives** shall state the substance of the following:

Disconnect the drive from the supply or switch off the automatic controls when maintenance, such as window cleaning, is being carried out in the vicinity.

#### 7.12.1 Addition:

The installation instructions shall state the substance of the following:

WARNING: Important safety instructions. Follow all instructions since incorrect installation can lead to severe injury.

The installation instructions shall indicate the type of **driven part** for which the **drive** is intended to be used.

They shall specify the mechanical parts necessary to couple the **drive** to the **driven part**.

NOTE 101 Mechanical parts to take account of variations in the **driven part** can be included in a website, catalogue or similar reference.

The installation instructions shall state the substance of the following where applicable:

- before installing the drive, remove any unnecessary cords or components and disable any equipment not needed for powered operation;
- install the actuating member of any manual release at a height less than 1,8 m above the floor or other access level.

The instructions shall include the following information:

- that the actuating member of a **biased-off switch** is to be located within direct sight of the **driven part** but away from moving parts. It is to be installed at a minimum height of 1,5 m above the floor or other access level;
- ~~– information if the **drive** is intended to be installed at a height of at least 2,5 m above floor level or other access level.~~
- if parts of the **drive** are intended to be installed more than 850 mm, 1,8 m or 2,3 m or at least 2,5 m above the floor or other access level in accordance with 8.1.1, Table 101, 20.2, 20.104, B.22.3 or B.22.4, the minimum height for installation of the **drive**. **8**

For **drives** supplied without a **driven part**, the installation instructions shall state the substance of the following:

- that the characteristics of the **driven part** must be compatible with the **rated load** and **rated operating time**;
- the minimum tube diameter needed to insert tubular **drives**;
- how to assemble the **driven part** and how to adjust the controls.

The installation instructions for awnings shall state that a horizontal distance of at least 0,4 m is to be maintained between the fully unrolled **driven part** and any permanent object.

For **drives** that are of **class III construction** and intended to be supplied by a **detachable power supply part** that is not provided with the **drive**, the installation instructions shall state the substance of the following:

The drive shall only be used with the detachable power supply units listed in these instructions. **9**

For **drives** intended for permanent connection to fixed wiring, delivered with a separate connector to ease the installation and establish the supply connection, the instructions shall state the substance of the following:

Only use the supplied connector when installing the drive. **10**

#### 7.15 Addition:

The marking of tubular **drives** may be concealed after installation. The markings shall also be provided with the instructions. In addition, the marking relevant to name, trademark or identification mark of the manufacturer or responsible vendor and the model or type reference can also be retrieved from a label, such as a matrix barcode, visible on the appliance after installation.

## 8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

### 8.1.1 Replacement:

*The requirement of 8.1 applies for all positions of the appliance when it is operated as in normal use.*

*Test probe B, test probe 18 and test probe 19 of IEC 61032 are applied with a force not exceeding 1 N, the appliance being in every possible position. Through openings, the test probe is applied to any depth that the probe will permit and is rotated or angled before, during and after insertion to any position. If the opening does not allow the entry of the probe, the force on the probe in the straight position is increased to 20 N when probe B is used or 10 N when test probe 18 or test probe 19 are used. If the test probe then enters the opening, the test is repeated with the probe in the angled position.*

*During the tests with test probe B, all **detachable parts** are removed except lamps. However, during insertion or removal of lamps, protection against contact with **live parts** of the lamp cap shall be ensured.*

*During the tests with test probe 18 and test probe 19 of IEC 61032, the appliance shall be fully assembled as in normal use without any parts removed.*

*Test probe 19 of IEC 61032 is not applied to parts of **drives** that are located at a height of more than 850 mm above the floor or other access level in normal use. **11***

*Test probe 18 of IEC 61032 is not applied to parts of **drives** that according to the instructions are required to be mounted at a height of more than 1,8 m above the floor or other access level. **12***

*It shall not be possible to touch **live parts** or **live parts** protected only by lacquer, enamel, ordinary paper, cotton, oxide film, beads, or sealing compound except self-hardening resins, with test probe B, test probe 18 or test probe 19, as applicable.*

### 8.2 ~~Modification~~ Addition:

**Basic insulation** and parts separated from **live parts** by **basic insulation** may be touched during adjustment, if a **tool** is needed to gain access to the adjustment means.

## 9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

## 10 Power input and current

This clause of Part 1 is applicable except as follows.

### 10.1 Modification:

*Instead of determining the mean value, the maximum value of power input is determined, the effect of inrush currents being ignored.*

### 10.2 Modification:

*Instead of determining the mean value, the maximum value of the current is determined, inrush currents being ignored.*

## 11 Heating

This clause of Part 1 is applicable except as follows.

### 11.3 Addition:

*Where the external **accessible surfaces** are suitably flat and access permits, then the test probe of Figure 103 is used to measure the temperature rises of external **accessible surfaces** specified in Table 101. The probe is applied with a force of  $4\text{ N} \pm 1\text{ N}$  to the surface in such a way that the best possible contact between the probe and the surface is ensured. The measurement is performed after a contact period of 30 s.*

*The probe may be held in place using a laboratory stand clamp or similar device. Any measuring instrument giving the same results as the probe may be used. 13*

### 11.7 ~~Replacement~~ Modification: 14

Replace the first paragraph with the following:

**Drives** for continuous operation are operated for consecutive cycles until steady conditions are established.

Other **drives** are operated as follows:

- **drives** supplied without a **driven part** are operated without rest periods for the **rated operating time** but for not less than 4 min;
- **drives** supplied with a **driven part** are operated without rest periods for the **rated number of operating cycles** but for not less than two cycles of operation.

Replace the first dashed item of the third paragraph with the following:

- the **battery** that has been **fully discharged** is charged for 1 h, while the appliance is operated as specified, if allowed by the construction of the appliance; 15

### 11.8 Modification:

Replace the first paragraph with the following text:

*During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and Table 101. 16*

**Table 101 – Maximum temperature rises  
for specified external accessible surfaces under normal operating conditions**

| Surface                                              | Temperature rise of external accessible surfaces <sup>a</sup>                                        |                                                                                                          |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
|                                                      | K                                                                                                    |                                                                                                          |
|                                                      | Surfaces of appliances not more than 850 mm above the floor or other access level after installation | Surfaces of appliances between 850 mm and 2,3 m above the floor or other access level after installation |
| Bare metal                                           | 38                                                                                                   | 42                                                                                                       |
| Coated metal <sup>b</sup>                            | 42                                                                                                   | 49                                                                                                       |
| Glass and ceramic                                    | 51                                                                                                   | 56                                                                                                       |
| Plastic and plastic coating > 0,4 mm <sup>c, d</sup> | 58                                                                                                   | 62                                                                                                       |

NOTE The temperature rise limits of handles, knobs, grips, keyboards, keypads and similar parts are specified in Table 3.

<sup>a</sup> Temperature rises are not measured on surfaces of appliances which, according to the instructions, shall be fixed to a wall or ceiling and where these surfaces are inaccessible to a 75 mm diameter probe having a hemispherical end.

<sup>b</sup> Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel, powder or non-substantially plastic coating is used.

<sup>c</sup> The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.

<sup>d</sup> When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal for underlying metal apply or the temperature rise limits for glass or ceramic material for underlying glass or ceramic material apply.

## 12 ~~Void~~ Charging of metal-ion batteries

This clause of Part 1 is applicable. **17**

## 13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable.

## 14 Transient overvoltages

This clause of Part 1 is applicable.

## 15 Moisture resistance

This clause of Part 1 is applicable except as follows.

### 15.1.2 Addition:

**Tubular drives** are installed in a tube that is open at both ends and has the largest diameter specified in the instructions. The tube has a length twice that of the motor and is mounted on a support as in normal use. The support is rotated at a speed of 1 r/min.

**Tubular drives** with a rolling **driven part** are tested with the **driven part** fully extended. At the end of the test the mains supply is reconnected and the **driven part** is fully retracted.

## 16 Leakage current and electric strength

This clause of Part 1 is applicable.

## 17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

## 18 Endurance

This clause of Part 1 is not applicable.

## 19 Abnormal operation

This clause of Part 1 is applicable except as follows.

### 19.10 Addition:

**Drives** for vertically moving **driven parts**, instead of being operated with the lowest possible load for 1 min, are operated for one downward run.

### 19.11.4.8 Modification:

Replace the second paragraph by the following:

*The **drive** shall either continue to move in the same direction of movement in its operating cycle at which the voltage decrease occurred or a manual operation shall be required to restart it.*

### 19.13 Addition:

*If, for the tests in 19.11.2 and 19.11.3, the **drive** can be operated when any of the fault conditions are simulated, the tests of 20.101 to 20.104 are carried out, the **drive**, however, being supplied at rated voltage.*

*Either the **drive** continues to fulfil the requirements, or, after a maximum of one cycle of operation:*

- *it shall stop with the **driven part** in a safe position, or*
- *the **drive** shall change to a **biased-off switch** mode of operation.*

**19.101 Drives**, other than those for continuous operation, are supplied at **rated voltage** and operated continuously under **normal operation**.

*During the test, the winding temperature shall not exceed the values specified in 19.9.*

## 20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

**20.2 Addition:**

Moving parts of **drives** intended to be installed at a height of at least 2,5 m above the ~~ground~~ floor or other access level are considered to be positioned so that adequate protection is provided against personal injury in normal use.

Test probe 18 of IEC 61032 is not applied to parts of **drives** that according to the installation instructions are required to be mounted at a height of more than 1,8 m above the floor or other access level. **18**

The test probe that is similar to test probe B of IEC 61032 but having a circular stop face with a diameter of 50 mm, instead of the non-circular face is not applied to parts of **drives** that according to the instructions are required to be mounted at a height of more than 2,5 m above the floor or other access level. **19**

Test probe 19 of IEC 61032 is applied to parts of the appliance placed at a height not more than 850 mm above the floor or other access level in normal use under the conditions specified for test probe 18. **20**

Stairs and terraces are examples of access levels. Surfaces not normally used for standing on, such as window-sills, and movable equipment such as ladders, are not considered to be access levels. **21**

**20.101** Rolling **driven parts** shall be prevented from unrolling in a hazardous manner.

Compliance is checked by the following test, which is carried out with the **drive** disconnected from the supply mains.

The **drive** is loaded with twice the **rated load** for 30 min. If the **drive** is supplied with a **driven part**, the load is applied to the **driven part** and is equal to the highest force exerted by it.

**NOTE**—The highest force is determined with the **driven part** in the most unfavourable position.

Spring-controlled **driven parts** are fully retracted and a force equal to the mass of the **driven part** is applied in the unrolling direction for 30 min.

The **driven part** shall not move faster than 150 mm/s.

The test is repeated with the **drive** supplied at 0,85 times **rated voltage**.

**20.102** **Drives** shall prevent the **driven part** from unrolling in a hazardous manner due to a reduction of the supply voltage.

Compliance is checked by the following test.

The **drive**, with the **driven part** approximately half unrolled, is supplied at 0,85 times **rated voltage** and operated until the **driven part** is fully unrolled. The **driven part** shall not unroll in an uncontrolled manner.

After 15 s, the **driven part** is retracted.

The **drive** is then supplied at 0,9 times **rated voltage** and started 10 times from different positions in the rolling direction so as to retract the **driven part**. The **drive** is allowed to come to rest between successive starts.

The **drive** shall retract the **driven part** to the fully rolled position each time and **protective devices** shall not operate.

**20.103** The actuation of a control to stop the movement of the **drive** shall be effective.

Compliance is checked by the following test.

The **drive** is supplied at **rated voltage** and operated under **normal operation** in each direction and the control is then actuated.

The **driven part** shall not move more than 100 mm before stopping.

~~NOTE~~ The release of a **biased-off switch** is considered to be actuation.

**20.104 Drives** shall operate so that injury is prevented during movement of the **driven part**.

This requirement is considered to be met if the **drive** is controlled by a fixed **biased-off switch** only or if the **driven part** at any point in travel is at a height of at least 1,8 m from the ~~ground~~ floor or any access point. This requirement is also considered to be met when the **driven part** is made of soft material and any rigid part of the **drive** is installed at 1,8 m above ~~ground~~ the floor or any access level.

For ~~drives for rolling driven parts~~ roller shutters intended to be fitted to a roof or ceiling window, compliance is checked by inspection, by measurement or by the tests of 20.104.1, or 20.104.2 or 20.104.3.

For **drives** for vertically moving **driven parts**, compliance is checked by inspection, by measurement or by the tests of 20.104.1 or 20.104.2. **22**

For **drives** for horizontally moving **driven parts**, compliance is checked by inspection, by measurement or by the tests of 20.104.4.

**Drives** intended to be used with a vertically moving **driven part** having openings in which a 50 mm diameter cylinder can be inserted are subjected to the opening test of 20.104.5.

Forces are measured by means of an instrument that incorporates a rigid plate having a diameter of 80 mm and a spring having a ratio of 500 N/mm  $\pm$  50 N/mm. The spring acts on a sensing element that is connected to an amplifier having a rise and fall time not exceeding 5 ms.

**20.104.1** The **drive** is supplied at **rated voltage** and operated under **normal operation** in the unrolling direction. The force exerted by the bottom edge of the **driven part** is measured at ~~the centre of the driven part at~~ 100 mm and 400 mm above the fully unrolled position.

The force is measured at the following locations:

- in the centre of the leading edge;
- 200 mm from each end of the leading edge if this edge is longer than 800 mm. **23**

The force shall not exceed

- 25 N, for more than 5 s;
- 150 N, for more than 0,5 s.

**20.104.2** The **drive** is installed with the **driven part** assembled in a rigid frame and positioned vertically. The **drive** is supplied at **rated voltage** and operated under **normal operation** **24**.

The bottom edge of the **driven part** is positioned approximately 160 mm from the fully unrolled position. A force of 150 N is applied upwards to the bottom edge.

The displacement shall be at least 40 mm.

**20.104.3** The **drive** is supplied at **rated voltage** and operated under **normal operation** in the unrolling direction. An obstacle is placed at ~~the centre of the driven part~~, 160 mm above the fully unrolled position. When the **driven part** reaches the obstacle, the **drive** shall stop ~~or reverse~~ the movement of the **driven part** and within 5 s start to reverse automatically. **25**

During this period, the force shall not exceed

- 250 N during the first 2 s after the force has exceeded 25 N;
- 150 N during a further period of 3 s.
- ~~— 25 N thereafter.~~

The distance between the bottom edge of the **driven part** and the obstacle is measured after the automatic reversing has stopped. The distance shall be at least 40 mm. **26**

**20.104.4** The **drive** is supplied at **rated voltage** and operated under **normal operation** in one direction. An obstacle is placed in the path of the leading edge and any counter opposing edges at a height equal to the middle of the **driven part**.

The force measured between the leading edge and any counter opposing edge at gaps of 50 mm and 500 mm shall not exceed:

- 250 N during the first 2 s after the force has exceeded 25 N;
- 150 N during a further period of 3 s;
- 25 N thereafter.

**20.104.5** ~~The **drive** is supplied at **rated voltage** and operated to open the **driven part** from the closed position, the **driven part** being loaded with a mass of 20 kg ± 0,5 kg.~~

~~The mass, having dimensions of approximately 200 mm × 200 mm × 200 mm, is fixed to the driven part in the most unfavourable place, with one edge adjacent to the bottom edge of the driven part.~~

~~If the bottom edge of the driven part moves more than 500 mm, the movement of the **driven part** shall stop before the test piece comes into contact with a counter opposing edge.~~

The **drive** is supplied at **rated voltage** and operated to open the **driven part** from the closed position, the **driven part** being loaded with a test piece having a mass of 20 kg ± 0,5 kg and dimensions of approximately 200 mm × 200 mm × 200 mm. This test piece is fixed to the **driven part** in the most unfavourable place, on each side of the **driven part**, one at a time, with one edge of the test piece at the bottom edge of the **driven part**.

Compliance is checked by the following:

- the bottom edge shall not move more than 50 mm; or
- the movement of the **driven part** shall stop before the test piece comes into contact with a counter-opposing edge;
- if the test piece comes into contact with the counter-opposing edge, the force measured between the test piece and the counter-opposing edge shall not exceed:
  - 250 N during the first 2 s after the force has exceeded 25 N;
  - 150 N during a further period of 3 s;

- 25 N thereafter.

If the gap between the **driven part** and fixed part of the installation (window, door, etc.) is 200 mm or less at all points during the movement of the **driven part**, the test piece is not applied on this side of the **driven part**. 27

**20.105** During the movement of the **drive** in either direction, the actuation of a manual control shall stop the movement if there is no separate button for the stop function.

If the **drive** has a single button for controlling the movement, further actuation shall reverse the direction of movement.

If the **drive** has three buttons for controlling the movement, one button shall be a stop button.

These requirements do not apply to controls affecting automatic modes of operation.

Any button that has a stop function shall not require a key to stop the **drive**.

*Compliance is checked by a manual test.*

## 21 Mechanical strength

This clause of Part 1 is applicable.

## 22 Construction

This clause of Part 1 is applicable except as follows.

**22.40** Not applicable.

**22.46** Addition:

If compliance with the requirements in Clause 20 relies on the operation of a programmable electronic circuit, the software shall contain measures to control the fault/error conditions specified in Table R.1.

**22.56** Addition:

If the **detachable power supply part** is not provided with the **drive**, the models validated according to this standard shall be defined in the instructions. 28

**22.101** It shall only be possible to make adjustments that could affect compliance with this standard by means of a **tool** or by use of a code.

*Compliance is checked by inspection.*

**22.102** **Drives** intended for permanent connection to fixed wiring may be delivered with a separate connector, to ease the installation and establish the supply connection. This connector shall be a **non-detachable part** once engaged. 29

Additionally, this connector shall not be interchangeable with plugs and socket-outlets listed in IEC TR 60083 or IEC 60906-1 or with appliance couplers complying with the standard sheets of IEC 60320-3. 30

*Compliance is checked by inspection.*

## 23 Internal wiring

This clause of Part 1 is applicable.

## 24 Components

This clause of Part 1 is applicable except as follows.

### 24.1.5 Addition:

Connectors that are **non-detachable parts** once engaged, are not considered to be part of an appliance coupler. **31**

**24.1.101** The relevant standard for a connector as referenced in 22.102 is IEC 61984:2008. Classification and ratings used for the tests of IEC 61984:2008, shall correspond to the ratings of the **drive** and its intended use.

The following subclauses of IEC 61984:2008 and the corresponding test requirements in Clause 7 are not applicable: 5.2 a), 5.4 d), 6.2.1, 6.2.2, 6.4.1, 6.4.2, 6.4.3, 6.10, 6.14.2, 6.14.3, 6.17, 6.19 and 6.20. Subclause 6.5.1 is also applicable for connectors without breaking capacity (COC). Subclauses 6.15 and 6.16 are applicable but are modified to the **drive** temperature ratings. The tests in Subclauses 7.3.6 and 7.3.7 are performed when the connector referenced in this subclause is engaged. **32**

## 25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

### 25.3 Addition:

Add the following after the first dashed item:

NOTE 101 The set of terminals can be located in a separate connector complying with 24.1.101. **33**

### 25.5 Addition:

**Type Z attachment** is allowed.

### 25.7 Addition:

The **supply cord** of **drives** for outdoor use shall be polychloroprene sheathed and not be lighter than ordinary polychloroprene sheathed flexible cord (code designation 60245 IEC 57).

### 25.8 Addition:

**Supply cords** of **class III appliances** need not comply with Table 11 if the temperature rises of the cord insulation specified in Table 3 and Table 9 are not exceeded during the tests of Clause 11 and Clause 19, respectively.

### 25.15 Addition:

For **class III appliances** and parts of **class III construction** that have a **rated power input** higher than 15 W, the pull force is 30 N. The test is not carried out on **class III appliances** or parts of a **class III construction** that have a **rated power input** less than or equal to 15 W.

## 26 Terminals for external conductors

This clause of Part 1 is applicable.

## 27 Provision for earthing

This clause of Part 1 is applicable.

## 28 Screws and connections

This clause of Part 1 is applicable.

## 29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable.

## 30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

### 30.2 Addition:

For **drives** *only* operated by a **biased-off switch**, 30.2.2 is applicable.

For other **drives**, 30.2.3 is applicable.

## 31 Resistance to rusting

This clause of Part 1 is applicable except as follows.

### Addition:

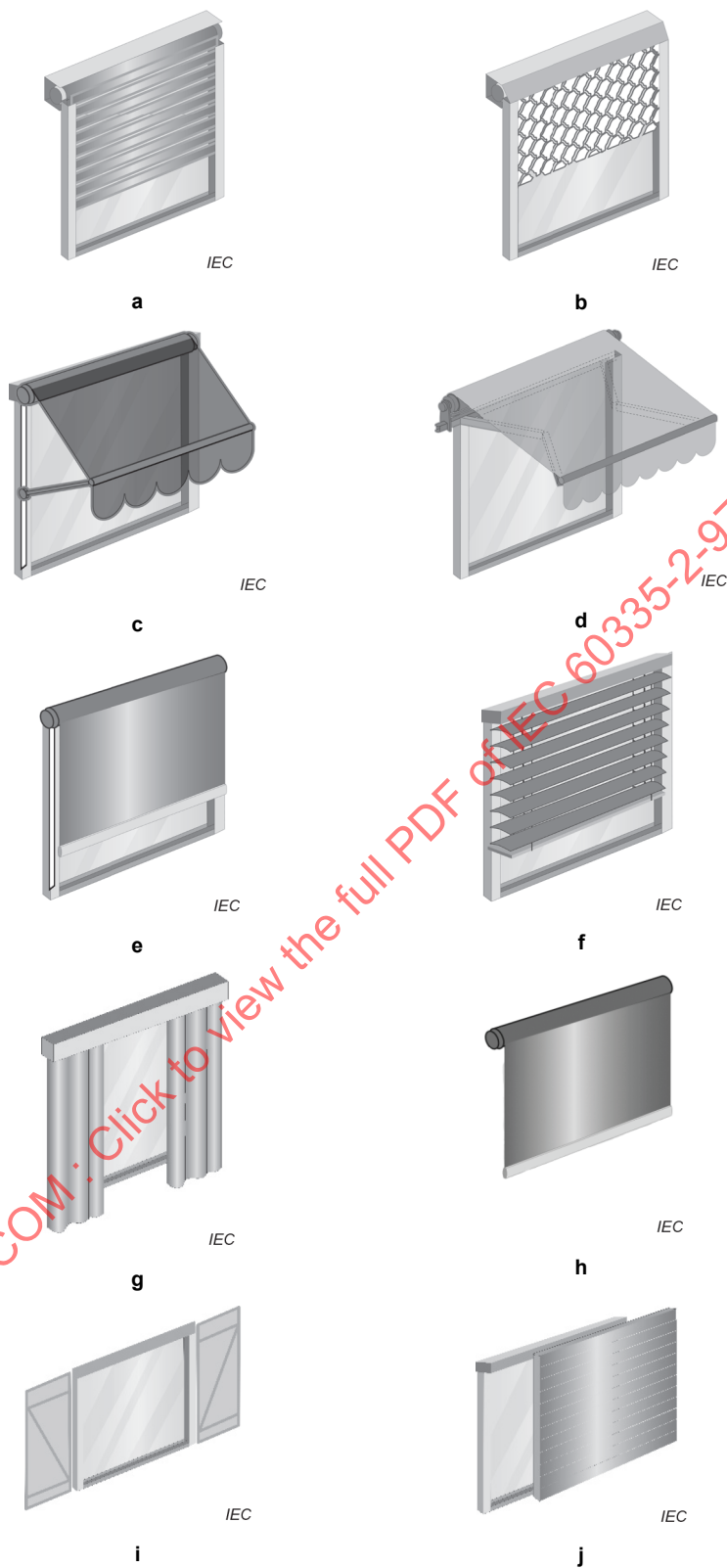
For parts intended to be installed outdoors, compliance is checked by the salt mist test of IEC 60068-2-52:2017, **severity test method 2** being applicable.

Before the test, coatings are scratched by means of a hardened steel pin, the end of which has the form of a cone with an angle of 40°. Its tip is rounded with a radius of 0,25 mm ± 0,02 mm. The pin is loaded so that the force exerted along its axis is 10 N ± 0,5 N. The scratches are made by drawing the pin along the surface of the coating at a speed of approximately 20 mm/s. Five scratches are made at least 5 mm apart and at least 5 mm from the edges.

After the test, the **drive** shall not have deteriorated to such an extent that compliance with this standard, in particular with Clauses 8 and 27, is impaired. The coating shall not be broken and shall not have loosened from the metal surface.

## 32 Radiation, toxicity and similar hazards

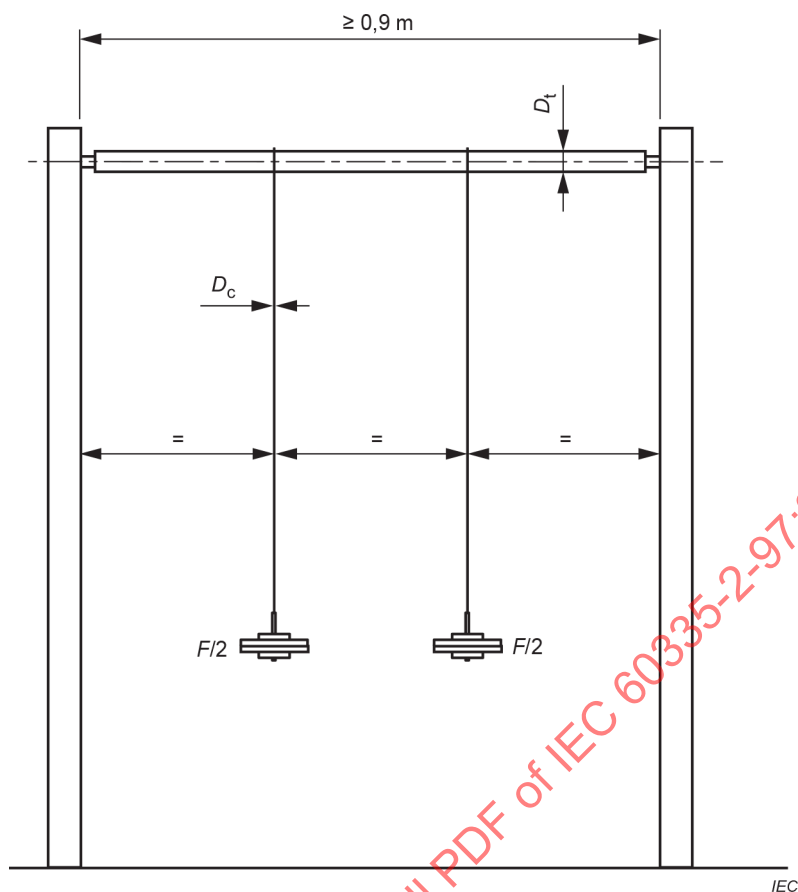
This clause of Part 1 is applicable.

**Key**

- a shutter
- b grille
- c awning
- d folding awning
- e blind

- f venetian blind
- g curtains
- h projection screen
- i swing shutter
- j sliding shutter

**Figure 101 – Examples of types of driven parts**



The applied load ( $F$ ), in newtons, is given by:

$$\frac{2\,000\,T_r}{D_t + D_c}$$

where

$T_r$  is the **rated load** in Nm;

$D_t$  is the tube diameter, in mm;

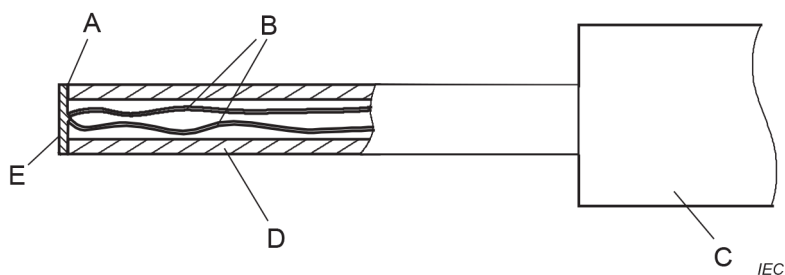
$D_c$  is the cord diameter, in mm.

NOTE 1  $D_t$  is the smallest diameter specified in the instructions.

NOTE 2 The load moves through a height of 2 m.

NOTE 3  $D_c$  is measured under load.

**Figure 102 – Example of test apparatus without a driven part for drives for rolling driven parts**



**Key**

- A adhesive
- B thermocouple wires 0,3 mm diameter to IEC 60584-1 Type K
- C handle arrangement permitting a contact force of  $4\text{ N} \pm 1\text{ N}$
- D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm
- E tinned copper disc: 5 mm diameter, 0,5 mm thick with a flat contact face

**Figure 103 – Probe for measuring surface temperatures**

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## **Annexes**

The annexes of Part 1 are applicable except as follows.

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## Annex B (normative)

### Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances

This annex of Part 1 is applicable except as follows:

#### 11.1 Replacement:

**Battery-operated appliances**, their surroundings, and **batteries** shall not attain excessive temperatures in normal use.

*Compliance is checked by determining the temperature rise of the various parts under the conditions specified in B.11.1, 11.2, 11.3, 11.7, and 11.8.*

*For **drives** for continuous operation, B.11.1 is applicable.*

*For other **drives**, B.11.1 is not applicable. Instead, other **drives** are tested according to 11.7 started with a **battery** that has been **fully charged**.*

*Any **batteries** shall not be depleted before the end of the **rated operating time** or **rated number of operating cycles** defined in 11.7. 34*

NOTE The temperature rising of the motor and surroundings parts are checked according to 11.7.

#### B.22.3 Addition:

*Test probe 19 of IEC 61032 is also applied as specified for test probe 18.*

*Test probe 19 of IEC 61032 is not applied to parts of **drives** that are located at a height of more than 850 mm above the floor or other access level in normal use.*

*Test probe 18 of IEC 61032 is not applied to parts of **drives** that according to the instructions are required to be mounted at a height of more than 1,8 m above the floor or other access level. 35*

#### B.22.4 Addition:

*Test probe 19 of IEC 61032 is also applied as specified for test probe 18.*

*Test probe 19 of IEC 61032 is not applied to parts of **drives** that are located at a height of more than 850 mm above the floor or other access level in normal use.*

*Test probe 18 of IEC 61032 is not applied to parts of **drives** that according to the instructions are required to be mounted at a height of more than 1,8 m above the floor or other access level. 36*

**Annex C**  
(normative)

**Ageing test on motors**

This annex of Part 1 is applicable except as follows:

*Modification:*

The value of  $p$  in Table C.1 is 2 000.

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## **Annex R** (normative)

### **Software evaluation**

This annex of Part 1 is applicable except as follows:

#### **R.2.2.5** *Addition:*

For other programmable **electronic circuits** with functions requiring software incorporating measures to control the fault/error conditions specified in Table R.1, detection of a fault/error shall occur within one cycle of operation if compliance with Clause 20 is impaired.

#### **R.2.2.9** *Addition:*

For other programmable **electronic circuits**, the software and safety-related hardware under its control shall be initialized and shall terminate within one cycle of operation if compliance Clause 20 is impaired.

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## Bibliography

The bibliography of Part 1 is applicable except as follows.

*Addition:*

IEC 60335-2-95, *Household and similar electrical appliances – Safety – Part 2-95: Particular requirements for drives for vertically moving garage doors for residential use*

IEC 60335-2-103, *Household and similar electrical appliances – Safety – Part 2-103: Particular requirements for drives for gates, doors and windows*

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## List of comments

- 1 This revision is for alignment with IEC 60335-1:2020.
- 2 This revision is for alignment with IEC 60335-1:2020.
- 3 This revision is for alignment with IEC 60335-1:2020.
- 4 This revision maintains the normal operation while charging as specified in IEC 60335-1:2020.
- 5 Explanation when the artificial load can be used according to the configuration of the system.
- 6 Added instruction to comply with Subclause 22.56 requirements.
- 7 This instruction is separated from the list above because it is information to be provided, not the substance of the text to be included in the instructions.
- 8 Because the minimum height of installation determines the appropriate accessibility probes and surface temperature limits, the installation instructions must include the minimum height of installation.
- 9 Added instruction to comply with Subclause 22.56 requirements.
- 10 This additional instruction is related to the allowance of a separate connector in Subclause 22.102. The instruction is intended to avoid the mating of male and female parts of connectors not tested with the drive.
- 11 Parts of drives can be located on or near the floor where they would be accessible to children up to 3 years in age. However, parts of drives located above 850 mm are not considered to be within reach of these children, so test probe 19 is not applied.
- 12 Parts of drives located above 1,8 m are not considered to be within reach of children up to 14 years in age according to IEC Guide 117, so test probe 18 is not applied.
- 13 Limits on the temperature rise of external accessible surfaces are introduced to address the risk of thermal injury from contact with external accessible surfaces based on IEC Guide 117 for Temperatures of touchable hot surfaces.
- 14 This revision maintains the requirements for appliance outlets and socket outlets and the test duration for charging of battery-operated appliances as specified in IEC 60335-1:2020.
- 15 This revision is for alignment with IEC 60335-1:2020 taking into account the cyclical operation of drives.
- 16 Limits on the temperature rise of external accessible surfaces are introduced to address the risk of thermal injury from contact with external accessible surfaces based on IEC Guide 117 for Temperatures of touchable hot surfaces.
- 17 This revision is for alignment with IEC 60335-1:2020.
- 18 Parts of drives located above 1,8 m are not considered to be within reach of children up to 14 years in age according to IEC Guide 117, so test probe 18 is not applied.
- 19 Parts of drives located above 2,5 m are not considered to be within reach of adults according to IEC Guide 117, so test probe B is not applied.
- 20 Parts of drives can be located on or near the floor where they would be accessible to children up to 3 years in age. However, parts of drives located above 850 mm are not considered to be within reach of these children, so test probe 19 is not applied.
- 21 This is added to clarify what is meant by access levels.

- 22 Clarification is added for the applicable tests for roller shutters and vertically moving driven parts.
  - 23 The force may be greater at the edges than in the centre. To cover hazards, new positions of tests are added.
  - 24 The basic test setup criteria is added to align with the other tests in Subclauses 20.104.1 through 20.104.5.
  - 25 The drive is now required to reverse direction after it stops.
  - 26 The drive must reverse for the duration needed to move the bottom edge of the driven part at least 40 mm from the obstacle.
  - 27 Test method is detailed to be coherent with the other force limitation test.
  - 28 Additional requirements to comply with the existing market needs.
  - 29 This addition allows use of a separate connector for the supply connection. Since fixed drives are connected to the power cord, the length is often adapted. Some flexibility during installation is required.
  - 30 This is to avoid the separate connector for installation purposes that can mate with standardised plug systems.
  - 31 This note clarifies that the separate connector referenced in Subclause 22.102 should not be confused with an appliance coupler because it cannot be disconnected "at will" (IEC ref 442-07-01).
  - 32 Subclause 24.1.101 sets the requirements for the separate connector referenced in Subclause 22.102 and the conditions under which it must comply with selected parts of IEC 61984:2008. Requirements in clauses made not applicable are already part of 60335 elsewhere or not relevant for this type of connector.
  - 33 This is a clarification that a supply connection utilising a separate connector as referenced in Subclause 22.102, will be allowed under the first dashed item (see Subclause 25.3 in IEC 60335-1:2020)
  - 34 This revision is for alignment with IEC 60335-1:2020 taking into consideration the cyclical operation of drives.
  - 35 This text is introduced to specify where test probes 18 and 19 are applied to align with the requirements in Subclause 8.1.1.
  - 36 This text is introduced to specify where test probes 18 and 19 are applied to align with the requirements in Subclause 8.1.1.
-

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Household and similar electrical appliances – Safety –  
Part 2-97: Particular requirements for drives for shutters, awnings, blinds and  
similar equipment**

**Appareils électrodomestiques et analogues – Sécurité –  
Partie 2-97: Exigences particulières pour les motorisations de volets, stores,  
rideaux et équipements analogues**

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# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

### Part 2-97: Particular requirements for drives for shutters, awnings, blinds and similar equipment

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IEC 60335-2-97 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 2016 and Amendment 1: 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, 5.10, 20.101, 20.103);

- d) use of artificial loads is introduced (5.10);
- e) application of test probe 19 has been introduced (8.1.1, 20.2);
- f) addition of surface temperatures for external accessible surfaces (11.3, 11.8);
- g) requirements are added for drives intended for permanent connection delivered with a connector to ease the installation (22.102, 24.1.101, 25.3);
- h) clarification for connectors that are non-detachable once engaged (24.1.5).
- i) added requirements for instructions for parts of class III construction supplied from a detachable power supply part (7.12, 7.12.1).

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

| Draft        | Report on voting |
|--------------|------------------|
| 61/7016/FDIS | 61/7081/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/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 shutters, awnings, blinds and similar equipment.

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](http://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.

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## 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 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 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.

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.

## HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

### Part 2-97: Particular requirements for drives for shutters, awnings, blinds and similar equipment

#### 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 shutters, blinds and awnings, intended for household and similar purposes, their **rated voltage** being not more than 250 V for single-phase **drives** and 480 V for other **drives**, including direct current (DC) supplied appliances and **battery-operated appliances**.

Examples of equipment that can be driven are

- spring controlled folding arm awnings;
- curtains;
- grilles covering doors and windows;
- projection screens;
- shutters covering doors and windows;
- draperies.

Examples are shown in Figure 101.

**Drives** can be supplied with a **driven part**.

**Drives** not intended for normal household use but that nevertheless can be a source of danger to the public, such as **drives** intended to be used by laymen in shops, in light industry, on farms and on industrial premises, are within the scope of this standard.

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**.

For appliances intended to be used in vehicles or on board ships or aircraft, additional requirements can be necessary. 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 and similar authorities.

This standard does not apply to

- **drives** intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);

- **drives** for vertically moving garage doors for residential use (IEC 60335-2-95);
- **drives** for gates, doors and windows (IEC 60335-2-103);
- **drives** used in premises such as hangars or in heavy industry;
- **drives** for theatre curtains.

## 2 Normative references

This clause of Part 1 is applicable except as follows.

*Addition:*

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

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

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 *Modification:*

Replace the first paragraph with the following:

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

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

#### 3.1.101

##### **rated load**

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

#### 3.1.102

##### **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.

#### 3.1.103

##### **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 and components for power transmission from the **drive** to the **driven part**.

### 3.7 Definitions relating to safety components

#### 3.7.101

##### **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

#### 3.8.101

##### **driven part**

movable part, such as a shutter, awning or blind, that is operated by the **drive**

## 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.

#### 5.10 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.*

*When the **drive** is supplied with the **driven part**, the **driven part** may be simulated by an artificial load, except for the tests of 20.104.1, 20.104.2, 20.104.3, 20.104.4 and 20.104.5.*

*When the **drive** is supplied without the **driven part**, the **driven part** shall be simulated by an artificial load or a representative **driven part** considering the manufacturer instructions to represent the most unfavourable conditions, except for the tests of 20.104.1, 20.104.2, 20.104.3, 20.104.4 and 20.104.5.*

*The tests of 20.104.1, 20.104.2, 20.104.3, 20.104.4 and 20.104.5 shall be carried out with the supplied **driven part**, or a representative **driven part** considering the manufacturer instructions to represent the most unfavourable conditions.*

*An example of an artificial load for rolling **driven parts** is in Figure 102.*

## 6 Classification

This clause of Part 1 is applicable except as follows.

#### 6.2 Addition:

**Drives** or parts of **drives** exposed to outdoor conditions shall be at least IPX4.

When **driven parts** are exposed to outdoor conditions, **drives** or parts of **drives** covered by the **driven part** shall be at least IPX4.

## 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

### 7.1 Addition:

**Drives** supplied without a **driven part** shall be marked with

- the **rated load**, in newtons (N) or in newton-metres (Nm);
- the **rated operating time**, in minutes, unless the **drive** is intended for continuous operation.

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

### 7.12 Modification:

Replace the fifth paragraph with the following:

The instructions for appliances having a part of **class III construction** supplied from a **detachable power supply part** shall state that the appliance is only to be used with the power supply provided with the appliance or the **detachable power supply part** listed in the instructions.

#### Addition:

The instructions for **drives** supplied with a **driven part** shall state that the **rated number of operating cycles** is not to be exceeded.

The instructions shall state the substance of the following:

WARNING: Important safety instructions. It is important for the safety of persons to follow these instructions. Save these instructions.

The instructions shall include the substance of the following where applicable:

- do not allow children to play with fixed controls. Keep remote controls away from children;
- frequently examine the installation for imbalance and signs of wear or damage to cables springs and fixings. Do not use if repair or adjustment is necessary;
- when operating a biased-off switch, make sure that other persons are kept away;
- do not operate when maintenance, such as window cleaning, is being carried out in the vicinity.

The instructions shall include details on how to use the manual release if applicable.

The instructions for automatically controlled **drives** shall state the substance of the following:

Disconnect the drive from the supply or switch off the automatic controls when maintenance, such as window cleaning, is being carried out in the vicinity.

#### 7.12.1 Addition:

The installation instructions shall state the substance of the following:

WARNING: Important safety instructions. Follow all instructions since incorrect installation can lead to severe injury.

The installation instructions shall indicate the type of **driven part** for which the **drive** is intended to be used.

They shall specify the mechanical parts necessary to couple the **drive** to the **driven part**.

NOTE 101 Mechanical parts to take account of variations in the **driven part** can be included in a website, catalogue or similar reference.

The installation instructions shall state the substance of the following where applicable:

- before installing the drive, remove any unnecessary cords or components and disable any equipment not needed for powered operation;
- install the actuating member of any manual release at a height less than 1,8 m above the floor or other access level.

The instructions shall include the following information:

- that the actuating member of a **biased-off switch** is to be located within direct sight of the **driven part** but away from moving parts. It is to be installed at a minimum height of 1,5 m above the floor or other access level;
- if parts of the **drive** are intended to be installed more than 850 mm, 1,8 m or 2,3 m or at least 2,5 m above the floor or other access level in accordance with 8.1.1, Table 101, 20.2, 20.104, B.22.3 or B.22.4, the minimum height for installation of the **drive**.

For **drives** supplied without a **driven part**, the installation instructions shall state the substance of the following:

- that the characteristics of the **driven part** must be compatible with the **rated load** and **rated operating time**;
- the minimum tube diameter needed to insert tubular **drives**;
- how to assemble the **driven part** and how to adjust the controls.

The installation instructions for awnings shall state that a horizontal distance of at least 0,4 m is to be maintained between the fully unrolled **driven part** and any permanent object.

For **drives** that are of **class III construction** and intended to be supplied by a **detachable power supply part** that is not provided with the **drive**, the installation instructions shall state the substance of the following:

The drive shall only be used with the detachable power supply units listed in these instructions.

For **drives** intended for permanent connection to fixed wiring, delivered with a separate connector to ease the installation and establish the supply connection, the instructions shall state the substance of the following:

Only use the supplied connector when installing the drive.

#### 7.15 Addition:

The marking of tubular **drives** may be concealed after installation. The markings shall also be provided with the instructions. In addition, the marking relevant to name, trademark or identification mark of the manufacturer or responsible vendor and the model or type reference can also be retrieved from a label, such as a matrix barcode, visible on the appliance after installation.

## 8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

### 8.1.1 Replacement:

*The requirement of 8.1 applies for all positions of the appliance when it is operated as in normal use.*

*Test probe B, test probe 18 and test probe 19 of IEC 61032 are applied with a force not exceeding 1 N, the appliance being in every possible position. Through openings, the test probe is applied to any depth that the probe will permit and is rotated or angled before, during and after insertion to any position. If the opening does not allow the entry of the probe, the force on the probe in the straight position is increased to 20 N when probe B is used or 10 N when test probe 18 or test probe 19 are used. If the test probe then enters the opening, the test is repeated with the probe in the angled position.*

*During the tests with test probe B, all **detachable parts** are removed except lamps. However, during insertion or removal of lamps, protection against contact with **live parts** of the lamp cap shall be ensured.*

*During the tests with test probe 18 and test probe 19 of IEC 61032, the appliance shall be fully assembled as in normal use without any parts removed.*

*Test probe 19 of IEC 61032 is not applied to parts of **drives** that are located at a height of more than 850 mm above the floor or other access level in normal use.*

*Test probe 18 of IEC 61032 is not applied to parts of **drives** that according to the instructions are required to be mounted at a height of more than 1,8 m above the floor or other access level.*

*It shall not be possible to touch **live parts** or **live parts** protected only by lacquer, enamel, ordinary paper, cotton, oxide film, beads, or sealing compound except self-hardening resins, with test probe B, test probe 18 or test probe 19, as applicable.*

## **8.2 Addition:**

**Basic insulation** and parts separated from **live parts** by **basic insulation** may be touched during adjustment, if a **tool** is needed to gain access to the adjustment means.

## **9 Starting of motor-operated appliances**

This clause of Part 1 is not applicable.

## **10 Power input and current**

This clause of Part 1 is applicable except as follows.

### **10.1 Modification:**

*Instead of determining the mean value, the maximum value of power input is determined, the effect of inrush currents being ignored.*

### **10.2 Modification:**

*Instead of determining the mean value, the maximum value of the current is determined, inrush currents being ignored.*

## **11 Heating**

This clause of Part 1 is applicable except as follows.

### 11.3 Addition:

Where the external **accessible surfaces** are suitably flat and access permits, then the test probe of Figure 103 is used to measure the temperature rises of external **accessible surfaces** specified in Table 101. The probe is applied with a force of  $4\text{ N} \pm 1\text{ N}$  to the surface in such a way that the best possible contact between the probe and the surface is ensured. The measurement is performed after a contact period of 30 s.

The probe may be held in place using a laboratory stand clamp or similar device. Any measuring instrument giving the same results as the probe may be used.

### 11.7 Modification:

Replace the first paragraph with the following:

**Drives** for continuous operation are operated for consecutive cycles until steady conditions are established.

Other **drives** are operated as follows:

- **drives** supplied without a **driven part** are operated without rest periods for the **rated operating time** but for not less than 4 min;
- **drives** supplied with a **driven part** are operated without rest periods for the **rated number of operating cycles** but for not less than two cycles of operation.

Replace the first dashed item of the third paragraph with the following:

- the **battery** that has been **fully discharged** is charged for 1 h, while the appliance is operated as specified, if allowed by the construction of the appliance;

### 11.8 Modification:

Replace the first paragraph with the following text:

During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and Table 101.

**Table 101 – Maximum temperature rises  
for specified external accessible surfaces under normal operating conditions**

| Surface                                              | Temperature rise of external accessible surfaces <sup>a</sup>                                        |                                                                                                          |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
|                                                      | K                                                                                                    |                                                                                                          |
|                                                      | Surfaces of appliances not more than 850 mm above the floor or other access level after installation | Surfaces of appliances between 850 mm and 2,3 m above the floor or other access level after installation |
| Bare metal                                           | 38                                                                                                   | 42                                                                                                       |
| Coated metal <sup>b</sup>                            | 42                                                                                                   | 49                                                                                                       |
| Glass and ceramic                                    | 51                                                                                                   | 56                                                                                                       |
| Plastic and plastic coating > 0,4 mm <sup>c, d</sup> | 58                                                                                                   | 62                                                                                                       |

NOTE The temperature rise limits of handles, knobs, grips, keyboards, keypads and similar parts are specified in Table 3.

<sup>a</sup> Temperature rises are not measured on surfaces of appliances which, according to the instructions, shall be fixed to a wall or ceiling and where these surfaces are inaccessible to a 75 mm diameter probe having a hemispherical end.

<sup>b</sup> Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel, powder or non-substantially plastic coating is used.

<sup>c</sup> The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.

<sup>d</sup> When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal for underlying metal apply or the temperature rise limits for glass or ceramic material for underlying glass or ceramic material apply.

## 12 Charging of metal-ion batteries

This clause of Part 1 is applicable.

## 13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable.

## 14 Transient overvoltages

This clause of Part 1 is applicable.

## 15 Moisture resistance

This clause of Part 1 is applicable except as follows.

### 15.1.2 Addition:

*Tubular **drives** are installed in a tube that is open at both ends and has the largest diameter specified in the instructions. The tube has a length twice that of the motor and is mounted on a support as in normal use. The support is rotated at a speed of 1 r/min.*

*Tubular **drives** with a rolling **driven part** are tested with the **driven part** fully extended. At the end of the test the mains supply is reconnected and the **driven part** is fully retracted.*

## 16 Leakage current and electric strength

This clause of Part 1 is applicable.

## 17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

## 18 Endurance

This clause of Part 1 is not applicable.

## 19 Abnormal operation

This clause of Part 1 is applicable except as follows.

### 19.10 Addition:

**Drives** for vertically moving **driven parts**, instead of being operated with the lowest possible load for 1 min, are operated for one downward run.

### 19.11.4.8 Modification:

Replace the second paragraph by the following:

*The **drive** shall either continue to move in the same direction of movement in its operating cycle at which the voltage decrease occurred or a manual operation shall be required to restart it.*

### 19.13 Addition:

*If, for the tests in 19.11.2 and 19.11.3, the **drive** can be operated when any of the fault conditions are simulated, the tests of 20.101 to 20.104 are carried out, the **drive**, however, being supplied at rated voltage.*

*Either the **drive** continues to fulfil the requirements, or, after a maximum of one cycle of operation:*

- it shall stop with the **driven part** in a safe position, or*
- the **drive** shall change to a **biased-off switch** mode of operation.*

**19.101 Drives**, other than those for continuous operation, are supplied at **rated voltage** and operated continuously under **normal operation**.

*During the test, the winding temperature shall not exceed the values specified in 19.9.*

## 20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

## 20.2 Addition:

Moving parts of **drives** intended to be installed at a height of at least 2,5 m above the floor or other access level are considered to be positioned so that adequate protection is provided against personal injury in normal use.

Test probe 18 of IEC 61032 is not applied to parts of **drives** that according to the installation instructions are required to be mounted at a height of more than 1,8 m above the floor or other access level.

The test probe that is similar to test probe B of IEC 61032 but having a circular stop face with a diameter of 50 mm, instead of the non-circular face is not applied to parts of **drives** that according to the instructions are required to be mounted at a height of more than 2,5 m above the floor or other access level.

Test probe 19 of IEC 61032 is applied to parts of the appliance placed at a height not more than 850 mm above the floor or other access level in normal use under the conditions specified for test probe 18.

Stairs and terraces are examples of access levels. Surfaces not normally used for standing on, such as window-sills, and movable equipment such as ladders, are not considered to be access levels.

**20.101** Rolling **driven parts** shall be prevented from unrolling in a hazardous manner.

Compliance is checked by the following test, which is carried out with the **drive** disconnected from the supply mains.

The **drive** is loaded with twice the **rated load** for 30 min. If the **drive** is supplied with a **driven part**, the load is applied to the **driven part** and is equal to the highest force exerted by it.

The highest force is determined with the **driven part** in the most unfavourable position.

Spring-controlled **driven parts** are fully retracted and a force equal to the mass of the **driven part** is applied in the unrolling direction for 30 min.

The **driven part** shall not move faster than 150 mm/s.

The test is repeated with the **drive** supplied at 0,85 times **rated voltage**.

**20.102** **Drives** shall prevent the **driven part** from unrolling in a hazardous manner due to a reduction of the supply voltage.

Compliance is checked by the following test.

The **drive**, with the **driven part** approximately half unrolled, is supplied at 0,85 times **rated voltage** and operated until the **driven part** is fully unrolled. The **driven part** shall not unroll in an uncontrolled manner.

After 15 s, the **driven part** is retracted.

The **drive** is then supplied at 0,9 times **rated voltage** and started 10 times from different positions in the rolling direction so as to retract the **driven part**. The **drive** is allowed to come to rest between successive starts.

The **drive** shall retract the **driven part** to the fully rolled position each time and **protective devices** shall not operate.

**20.103** The actuation of a control to stop the movement of the **drive** shall be effective.

*Compliance is checked by the following test.*

The **drive** is supplied at **rated voltage** and operated under **normal operation** in each direction and the control is then actuated.

The **driven part** shall not move more than 100 mm before stopping.

The release of a **biased-off switch** is considered to be actuation.

**20.104 Drives** shall operate so that injury is prevented during movement of the **driven part**.

This requirement is considered to be met if the **drive** is controlled by a fixed **biased-off switch** only or if the **driven part** at any point in travel is at a height of at least 1,8 m from the floor or any access point. This requirement is also considered to be met when the **driven part** is made of soft material and any rigid part of the **drive** is installed at 1,8 m above the floor or any access level.

*For roller shutters intended to be fitted to a roof or ceiling window, compliance is checked by inspection, by measurement or by the tests of 20.104.1, or 20.104.2 or 20.104.3.*

*For **drives** for vertically moving **driven parts**, compliance is checked by inspection, by measurement or by the tests of 20.104.1 or 20.104.2.*

*For **drives** for horizontally moving **driven parts**, compliance is checked by inspection, by measurement or by the tests of 20.104.4.*

**Drives** intended to be used with a vertically moving **driven part** having openings in which a 50 mm diameter cylinder can be inserted are subjected to the opening test of 20.104.5.

Forces are measured by means of an instrument that incorporates a rigid plate having a diameter of 80 mm and a spring having a ratio of 500 N/mm  $\pm$  50 N/mm. The spring acts on a sensing element that is connected to an amplifier having a rise and fall time not exceeding 5 ms.

**20.104.1** The **drive** is supplied at **rated voltage** and operated under **normal operation** in the unrolling direction. The force exerted by the bottom edge of the **driven part** is measured at 100 mm and 400 mm above the fully unrolled position.

*The force is measured at the following locations:*

- in the centre of the leading edge;
- 200 mm from each end of the leading edge if this edge is longer than 800 mm.

*The force shall not exceed*

- 25 N, for more than 5 s;
- 150 N, for more than 0,5 s.

**20.104.2** The **drive** is installed with the **driven part** assembled in a rigid frame and positioned vertically. The **drive** is supplied at **rated voltage** and operated under **normal operation**. The bottom edge of the **driven part** is positioned approximately 160 mm from the fully unrolled position. A force of 150 N is applied upwards to the bottom edge.

The displacement shall be at least 40 mm.

**20.104.3** The **drive** is supplied at **rated voltage** and operated under **normal operation** in the unrolling direction. An obstacle is placed at 160 mm above the fully unrolled position. When the **driven part** reaches the obstacle, the **drive** shall stop the movement of the **driven part** and within 5 s start to reverse automatically.

During this period, the force shall not exceed

- 250 N during the first 2 s after the force has exceeded 25 N;
- 150 N during a further period of 3 s.

The distance between the bottom edge of the **driven part** and the obstacle is measured after the automatic reversing has stopped. The distance shall be at least 40 mm.

**20.104.4** The **drive** is supplied at **rated voltage** and operated under **normal operation** in one direction. An obstacle is placed in the path of the leading edge and any counter opposing edges at a height equal to the middle of the **driven part**.

The force measured between the leading edge and any counter opposing edge at gaps of 50 mm and 500 mm shall not exceed:

- 250 N during the first 2 s after the force has exceeded 25 N;
- 150 N during a further period of 3 s;
- 25 N thereafter.

**20.104.5** The **drive** is supplied at **rated voltage** and operated to open the **driven part** from the closed position, the **driven part** being loaded with a test piece having a mass of  $20\text{ kg} \pm 0,5\text{ kg}$  and dimensions of approximately  $200\text{ mm} \times 200\text{ mm} \times 200\text{ mm}$ . This test piece is fixed to the **driven part** in the most unfavourable place, on each side of the **driven part**, one at a time, with one edge of the test piece at the bottom edge of the **driven part**.

Compliance is checked by the following:

- the bottom edge shall not move more than 50 mm; or
- the movement of the **driven part** shall stop before the test piece comes into contact with a counter-opposing edge;
- if the test piece comes into contact with the counter-opposing edge, the force measured between the test piece and the counter-opposing edge shall not exceed:
  - 250 N during the first 2 s after the force has exceeded 25 N;
  - 150 N during a further period of 3 s;
  - 25 N thereafter.

If the gap between the **driven part** and fixed part of the installation (window, door, etc.) is 200 mm or less at all points during the movement of the **driven part**, the test piece is not applied on this side of the **driven part**.

**20.105** During the movement of the **drive** in either direction, the actuation of a manual control shall stop the movement if there is no separate button for the stop function.

If the **drive** has a single button for controlling the movement, further actuation shall reverse the direction of movement.

If the **drive** has three buttons for controlling the movement, one button shall be a stop button.

These requirements do not apply to controls affecting automatic modes of operation.

Any button that has a stop function shall not require a key to stop the **drive**.

*Compliance is checked by a manual test.*

## 21 Mechanical strength

This clause of Part 1 is applicable.

## 22 Construction

This clause of Part 1 is applicable except as follows.

**22.40** Not applicable.

**22.46** *Addition:*

If compliance with the requirements in Clause 20 relies on the operation of a programmable electronic circuit, the software shall contain measures to control the fault/error conditions specified in Table R.1.

**22.56** *Addition:*

If the **detachable power supply part** is not provided with the **drive**, the models validated according to this standard shall be defined in the instructions.

**22.101** It shall only be possible to make adjustments that could affect compliance with this standard by means of a **tool** or by use of a code.

*Compliance is checked by inspection.*

**22.102 Drives** intended for permanent connection to fixed wiring may be delivered with a separate connector, to ease the installation and establish the supply connection. This connector shall be a **non-detachable part** once engaged.

Additionally, this connector shall not be interchangeable with plugs and socket-outlets listed in IEC TR 60083 or IEC 60906-1 or with appliance couplers complying with the standard sheets of IEC 60320-3.

*Compliance is checked by inspection.*

## 23 Internal wiring

This clause of Part 1 is applicable.

## 24 Components

This clause of Part 1 is applicable except as follows.

**24.1.5** *Addition:*

Connectors that are **non-detachable parts** once engaged, are not considered to be part of an appliance coupler.

**24.1.101** *The relevant standard for a connector as referenced in 22.102 is IEC 61984:2008. Classification and ratings used for the tests of IEC 61984:2008, shall correspond to the ratings of the **drive** and its intended use.*

*The following subclauses of IEC 61984:2008 and the corresponding test requirements in Clause 7 are not applicable: 5.2 a), 5.4 d), 6.2.1, 6.2.2, 6.4.1, 6.4.2, 6.4.3, 6.10, 6.14.2, 6.14.3, 6.17, 6.19 and 6.20. Subclause 6.5.1 is also applicable for connectors without breaking capacity (COC). Subclauses 6.15 and 6.16 are applicable but are modified to the **drive** temperature ratings. The tests in Subclauses 7.3.6 and 7.3.7 are performed when the connector referenced in this subclause is engaged.*

## 25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

### 25.3 Addition:

Add the following after the first dashed item:

NOTE 101 The set of terminals can be located in a separate connector complying with 24.1.101.

### 25.5 Addition:

**Type Z attachment** is allowed.

### 25.7 Addition:

The **supply cord** of **drives** for outdoor use shall be polychloroprene sheathed and not be lighter than ordinary polychloroprene sheathed flexible cord (code designation 60245 IEC 57).

### 25.8 Addition:

**Supply cords** of **class III appliances** need not comply with Table 11 if the temperature rises of the cord insulation specified in Table 3 and Table 9 are not exceeded during the tests of Clause 11 and Clause 19, respectively.

### 25.15 Addition:

*For **class III appliances** and parts of **class III construction** that have a **rated power input** higher than 15 W, the pull force is 30 N. The test is not carried out on **class III appliances** or parts of a **class III construction** that have a **rated power input** less than or equal to 15 W.*

## 26 Terminals for external conductors

This clause of Part 1 is applicable.

## 27 Provision for earthing

This clause of Part 1 is applicable.

## 28 Screws and connections

This clause of Part 1 is applicable.

## 29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable.

## 30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

### 30.2 Addition:

For **drives** only operated by a **biased-off switch**, 30.2.2 is applicable.

For other **drives**, 30.2.3 is applicable.

## 31 Resistance to rusting

This clause of Part 1 is applicable except as follows.

Addition:

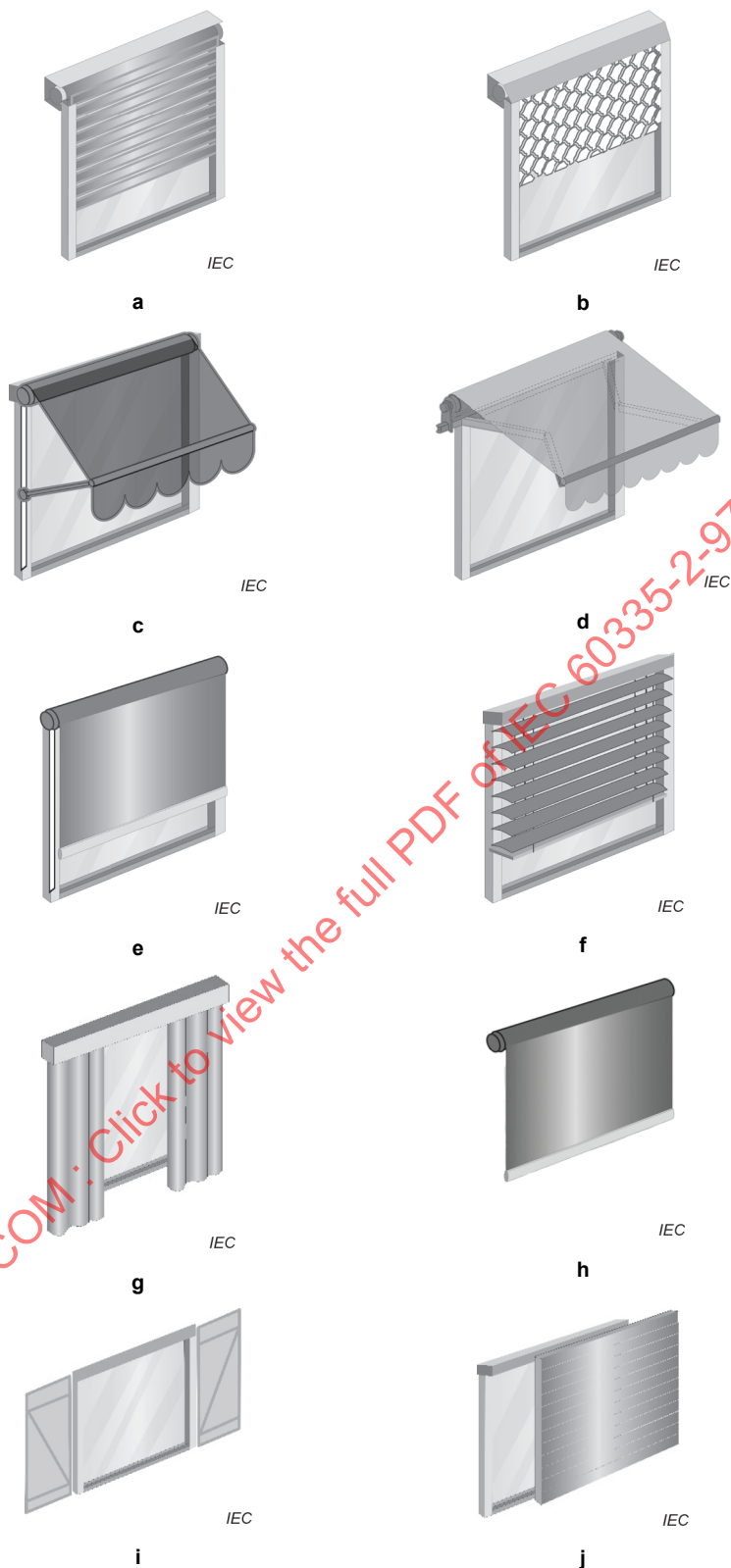
For parts intended to be installed outdoors, compliance is checked by the salt mist test of IEC 60068-2-52:2017, test method 2 being applicable.

Before the test, coatings are scratched by means of a hardened steel pin, the end of which has the form of a cone with an angle of 40°. Its tip is rounded with a radius of 0,25 mm ± 0,02 mm. The pin is loaded so that the force exerted along its axis is 10 N ± 0,5 N. The scratches are made by drawing the pin along the surface of the coating at a speed of approximately 20 mm/s. Five scratches are made at least 5 mm apart and at least 5 mm from the edges.

After the test, the **drive** shall not have deteriorated to such an extent that compliance with this standard, in particular with Clauses 8 and 27, is impaired. The coating shall not be broken and shall not have loosened from the metal surface.

## 32 Radiation, toxicity and similar hazards

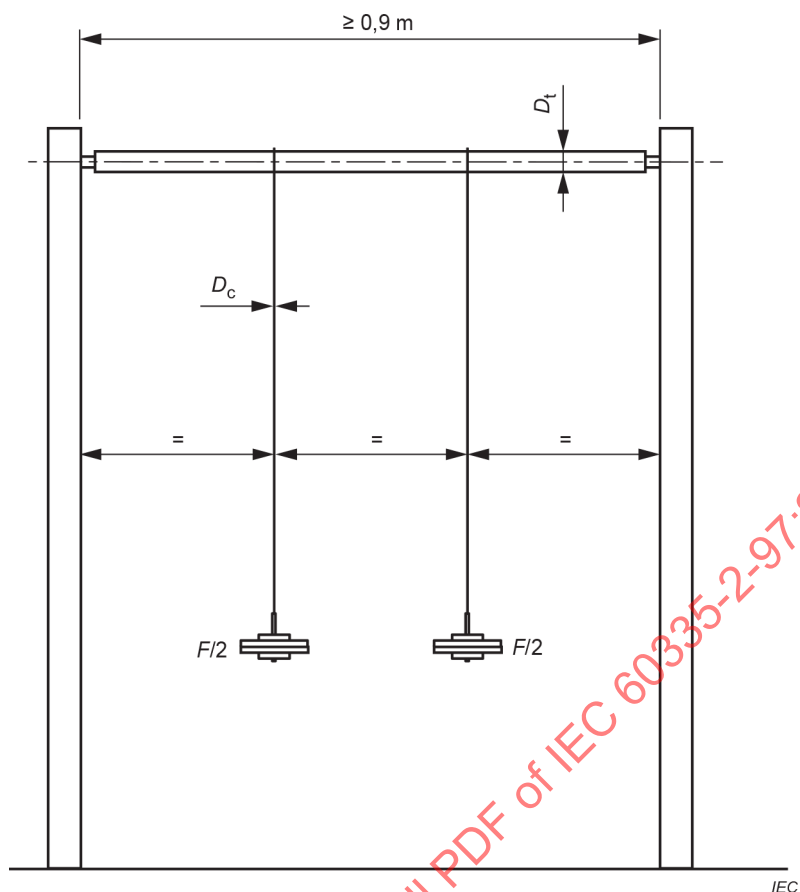
This clause of Part 1 is applicable.

**Key**

- a shutter
- b grille
- c awning
- d folding awning
- e blind

- f venetian blind
- g curtains
- h projection screen
- i swing shutter
- j sliding shutter

**Figure 101 – Examples of types of driven parts**



The applied load ( $F$ ), in newtons, is given by:

$$\frac{2\,000\,T_r}{D_t + D_c}$$

where

$T_r$  is the **rated load** in Nm;

$D_t$  is the tube diameter, in mm;

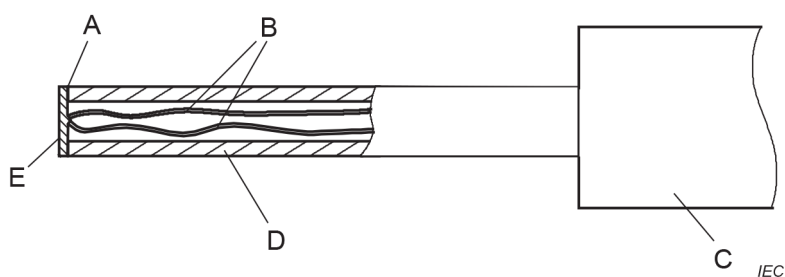
$D_c$  is the cord diameter, in mm.

NOTE 1  $D_t$  is the smallest diameter specified in the instructions.

NOTE 2 The load moves through a height of 2 m.

NOTE 3  $D_c$  is measured under load.

**Figure 102 – Example of test apparatus without a driven part for drives for rolling driven parts**

**Key**

- A adhesive
- B thermocouple wires 0,3 mm diameter to IEC 60584-1 Type K
- C handle arrangement permitting a contact force of  $4\text{ N} \pm 1\text{ N}$
- D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm
- E tinned copper disc: 5 mm diameter, 0,5 mm thick with a flat contact face

**Figure 103 – Probe for measuring surface temperatures**

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## Annexes

The annexes of Part 1 are applicable except as follows.

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## Annex B (normative)

### Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances

This annex of Part 1 is applicable except as follows:

#### 11.1 Replacement:

**Battery-operated appliances**, their surroundings, and **batteries** shall not attain excessive temperatures in normal use.

*Compliance is checked by determining the temperature rise of the various parts under the conditions specified in B.11.1, 11.2, 11.3, 11.7, and 11.8.*

*For **drives** for continuous operation, B.11.1 is applicable.*

*For other **drives**, B.11.1 is not applicable. Instead, other **drives** are tested according to 11.7 started with a **battery** that has been **fully charged**.*

*Any **batteries** shall not be depleted before the end of the **rated operating time** or **rated number of operating cycles** defined in 11.7.*

NOTE The temperature rising of the motor and surroundings parts are checked according to 11.7.

#### B.22.3 Addition:

*Test probe 19 of IEC 61032 is also applied as specified for test probe 18.*

*Test probe 19 of IEC 61032 is not applied to parts of **drives** that are located at a height of more than 850 mm above the floor or other access level in normal use.*

*Test probe 18 of IEC 61032 is not applied to parts of **drives** that according to the instructions are required to be mounted at a height of more than 1,8 m above the floor or other access level.*

#### B.22.4 Addition:

*Test probe 19 of IEC 61032 is also applied as specified for test probe 18.*

*Test probe 19 of IEC 61032 is not applied to parts of **drives** that are located at a height of more than 850 mm above the floor or other access level in normal use.*

*Test probe 18 of IEC 61032 is not applied to parts of **drives** that according to the instructions are required to be mounted at a height of more than 1,8 m above the floor or other access level.*

**Annex C**  
(normative)

**Ageing test on motors**

This annex of Part 1 is applicable except as follows:

*Modification:*

The value of  $p$  in Table C.1 is 2 000.

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## Annex R (normative)

### Software evaluation

This annex of Part 1 is applicable except as follows:

#### R.2.2.5 *Addition:*

For other programmable **electronic circuits** with functions requiring software incorporating measures to control the fault/error conditions specified in Table R.1, detection of a fault/error shall occur within one cycle of operation if compliance with Clause 20 is impaired.

#### R.2.2.9 *Addition:*

For other programmable **electronic circuits**, the software and safety-related hardware under its control shall be initialized and shall terminate within one cycle of operation if compliance Clause 20 is impaired.

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## Bibliography

The bibliography of Part 1 is applicable except as follows.

*Addition:*

IEC 60335-2-95, *Household and similar electrical appliances – Safety – Part 2-95: Particular requirements for drives for vertically moving garage doors for residential use*

IEC 60335-2-103, *Household and similar electrical appliances – Safety – Part 2-103: Particular requirements for drives for gates, doors and windows*

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## COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

### APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

#### Partie 2-97: Exigences particulières pour les motorisations des volets, stores, rideaux et équipements analogues

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L'IEC 60335-2-97 a été établie par le comité d'études 61 de l'IEC: Sécurité des appareils électrodomestiques et analogues. Il s'agit d'une Norme internationale.

Cette quatrième édition annule et remplace la troisième édition parue en 2016 et l'Amendement 1:2019. Cette édition constitue une révision technique.

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

- a) le texte a été aligné sur l'IEC 60335-1:2020;
- b) le domaine d'application comprend les appareils alimentés en courant continu et les appareils alimentés par batteries (Article 1);
- c) certaines notes ont été converties en texte normatif (Article 1, 5.10, 20.101, 20.103);
- d) l'utilisation de charges artificielles a été introduite (5.10);
- e) l'application du calibre d'essai 19 a été introduite (8.1.1, 20.2);
- f) des températures de surface ont été ajoutées pour les surfaces accessibles extérieures (11.3, 11.8);
- g) des exigences ont été ajoutées pour les motorisations destinées à être raccordées de façon permanente livrées avec un connecteur afin de faciliter l'installation (22.102, 24.1.101, 25.3);
- h) une clarification a été apportée pour les connecteurs qui ne sont pas amovibles lorsqu'ils sont engagés (24.1.5);
- i) des exigences relatives aux instructions pour les parties de la classe III alimentées par une partie d'alimentation amovible ont été ajoutées (7.12, 7.12.1).

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

| Projet       | Rapport de vote |
|--------------|-----------------|
| 61/7016/FDIS | 61/7081/RVD     |

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). Les principaux types de documents développés par l'IEC sont décrits plus en détail sous [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

Une liste de toutes les parties de la série IEC 60335, publiées sous le titre général *Appareils électrodomestiques et analogues – Sécurité*, se trouve sur le site web de l'IEC.

La présente partie 2 doit être utilisée conjointement avec la dernière édition de l'IEC 60335-1 et ses amendements sauf si cette édition l'exclut. Dans ce cas, la dernière édition qui n'exclut pas la présente partie 2 est utilisée. Elle a été établie sur la base de la sixième édition (2020) de cette norme.

NOTE 1 L'expression "la Partie 1" utilisée dans la présente norme fait référence à l'IEC 60335-1.

La présente partie 2 complète ou modifie les articles correspondants de l'IEC 60335-1, de façon à transformer cette publication en norme IEC: Exigences particulières pour les motorisations des volets, stores, rideaux et équipements analogues.

Lorsqu'un paragraphe particulier de la Partie 1 n'est pas mentionné dans la présente partie 2, ce paragraphe s'applique pour autant que cela soit raisonnable. Lorsque la présente norme mentionne "addition", "modification" ou "remplacement", le texte correspondant de la Partie 1 doit être adapté en conséquence.

NOTE 2 Le système de numérotation suivant est utilisé:

- les paragraphes, tableaux et figures qui s'ajoutent à ceux de la Partie 1 sont numérotés à partir de 101;
- à l'exception de celles qui sont dans un nouveau paragraphe ou de celles qui concernent des notes de la Partie 1, les notes sont numérotées à partir de 101, y compris celles des articles ou paragraphes qui sont remplacés;
- les annexes qui sont ajoutées sont désignées AA, BB, etc.

NOTE 3 Les caractères d'imprimerie suivants sont utilisés:

- exigences: caractères romains;
- *modalités d'essais: caractères italiques;*
- notes: petits caractères romains.

Les termes en **gras** dans le texte sont définis à l'Article 3. Lorsqu'une définition concerne un adjectif, l'adjectif et le nom associé figurent également en gras.

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 [webstore.iec.ch](http://webstore.iec.ch) dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
- supprimé, ou
- révisé.

NOTE 4 L'attention des Comités nationaux est attirée sur le fait que les fabricants d'appareils et les organismes d'essai peuvent avoir besoin d'une période transitoire après la publication d'une nouvelle publication IEC, ou d'une publication amendée ou révisée, pour fabriquer des produits conformes aux nouvelles exigences et pour adapter leurs équipements aux nouveaux essais ou aux essais révisés.

Le comité recommande que le contenu de cette publication soit adopté pour application nationale (obligatoire) au plus tôt 12 mois et au plus tard 36 mois après la date de publication.

## INTRODUCTION

Il a été admis par hypothèse, en établissant la présente Norme internationale, que l'exécution de ses dispositions était confiée à des personnes expérimentées et ayant une qualification appropriée.

Les documents de recommandations concernant l'application des exigences de sécurité pour les appareils peuvent être consultés dans les documents de support du CE 61, accessibles sur le site web de l'IEC à l'adresse:

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

Cette information est donnée à l'intention des utilisateurs de la présente Norme internationale et ne constitue nullement un remplacement du texte normatif de la présente norme.

La présente norme reconnaît le niveau de protection internationalement accepté contre les dangers électriques, mécaniques, thermiques, liés au feu et au rayonnement des appareils, lorsqu'ils fonctionnent comme en usage normal en tenant compte des instructions du fabricant. Elle couvre également les situations anormales auxquelles on peut s'attendre dans la pratique et elle tient compte de la façon dont les phénomènes électromagnétiques peuvent affecter le fonctionnement sûr des appareils.

La présente norme tient compte autant que possible des exigences de l'IEC 60364, de façon à rester compatible avec les règles d'installation quand l'appareil est raccordé au réseau d'alimentation. Cependant, des règles nationales d'installation peuvent être différentes.

Si un appareil relevant du domaine d'application de la présente norme comporte également des fonctions couvertes par une autre partie 2 de l'IEC 60335, la partie 2 correspondante est appliquée à chaque fonction séparément, dans la limite du raisonnable. Si cela s'applique, l'influence d'une fonction sur les autres fonctions est prise en compte.

Lorsqu'une partie 2 ne comporte pas d'exigences complémentaires pour couvrir les dangers traités dans la Partie 1, la Partie 1 s'applique.

NOTE 1 Cela signifie que les comités d'études responsables pour les parties 2 ont déterminé qu'il n'était pas nécessaire de spécifier des exigences particulières pour l'appareil en question en plus des exigences générales.

La présente norme est une norme de famille de produits traitant de la sécurité d'appareils et a préséance sur les normes horizontales et génériques couvrant le même sujet.

NOTE 2 Les publications horizontales, les publications fondamentales de sécurité et les publications groupées de sécurité couvrant un danger ne s'appliquent pas, parce qu'elles ont été prises en considération lorsque les exigences générales et particulières ont été étudiées pour la série de normes IEC 60335.

Un appareil conforme au texte de la présente norme ne sera pas nécessairement jugé conforme aux principes de sécurité de la norme si, lorsqu'il est examiné et soumis aux essais, il apparaît qu'il présente d'autres caractéristiques qui compromettent le niveau de sécurité visé par ces exigences.

Un appareil utilisant des matériaux ou présentant des modes de construction différents de ceux décrits dans les exigences de la présente norme peut être examiné et soumis aux essais en fonction de l'objectif poursuivi par ces exigences et, s'il est jugé pratiquement équivalent, il peut être estimé conforme aux principes de sécurité de la présente norme.

NOTE 3 Les normes traitant des aspects non relatifs à la sécurité des appareils électrodomestiques sont:

- les normes IEC publiées par le comité d'études 59 concernant les méthodes de mesure d'aptitude à la fonction;
- les normes CISPR 11 et CISPR 14-1, ainsi que les normes applicables de la série IEC 61000-3 concernant les émissions électromagnétiques;
- la norme CISPR 14-2 concernant l'immunité électromagnétique;
- les normes IEC publiées par le comité d'études 111 concernant l'environnement.

## APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

### Partie 2-97: Exigences particulières pour les motorisations des volets, stores, rideaux et équipements analogues

#### 1 Domaine d'application

L'article de la Partie 1 est remplacé par le texte suivant.

La présente partie de l'IEC 60335 traite de la sécurité des **motorisations** électriques pour les volets, les rideaux et les stores pour usage domestique et analogue, dont la **tension assignée** est inférieure ou égale à 250 V pour les **motorisations** monophasées et à 480 V pour les autres **motorisations**, y compris les appareils alimentés en courant continu et les **appareils alimentés par batteries**.

Des exemples d'équipements qui peuvent être motorisés sont:

- les stores bannes à ressorts;
- les rideaux;
- les grilles qui protègent les portes et les fenêtres;
- les écrans de projection;
- les volets qui protègent les portes et les fenêtres;
- les draperies.

Des exemples sont représentés à la Figure 101.

Les **motorisations** peuvent être livrées avec une **partie entraînée**.

Les **motorisations** qui ne sont pas destinées à un usage domestique normal, mais qui néanmoins peuvent constituer une source de danger pour le public, telle que les **motorisations** destinées à être utilisées par des utilisateurs non avertis dans des magasins, chez des artisans, dans des fermes et dans des locaux industriels, sont comprises dans le domaine d'application de la présente norme.

Dans la mesure du possible, la présente norme traite des dangers ordinaires présentés par les **motorisations**, encourus par toutes les personnes à l'intérieur et autour de l'habitation. Cependant, elle ne tient pas compte en général

- des personnes (y compris des enfants) dont
  - les capacités physiques, sensorielles ou mentales; ou
  - le manque d'expérience et de connaissanceles empêchent d'utiliser la **motorisation** en toute sécurité sans surveillance ou instruction;
- de l'utilisation de la **motorisation** comme jouet par des enfants.

Pour les appareils destinés à être utilisés dans des véhicules ou à bord de navires ou d'avions, des exigences supplémentaires peuvent être nécessaires. Dans de nombreux pays, des exigences supplémentaires sont spécifiées par les organismes nationaux de la santé, par les organismes nationaux responsables de la protection des travailleurs, par les organismes nationaux responsables de l'alimentation en eau et par des organismes similaires.

La présente norme ne s'applique pas

- aux **motorisations** destinées à être utilisées dans des locaux qui présentent des conditions particulières, telles que la présence d'une atmosphère corrosive ou explosive (poussière, vapeur ou gaz);
- aux **motorisations** de portes de garage à ouverture verticale pour usage résidentiel (IEC 60335-2-95);
- aux **motorisations** de portails, portes et fenêtres (IEC 60335-2-103);
- aux **motorisations** utilisées dans des locaux tels que les hangars d'avions ou dans l'industrie lourde;
- aux **motorisations** pour rideaux de théâtres.

## 2 Références normatives

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

*Addition:*

IEC 60068-2-52:2017, *Essais d'environnement – Partie 2-52: Essais – Essai Kb: Brouillard salin, essai cyclique (solution de chlorure de sodium)*

IEC 60584-1, *Couples thermoélectriques – Partie 1: Spécifications et tolérances en matière de FEM*

IEC 61984:2008, *Connecteurs – Exigences de sécurité et essais*

## 3 Termes et définitions

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

### 3.1 Définitions relatives aux caractéristiques physiques

#### 3.1.9 *Modification:*

Remplacer le premier alinéa par ce qui suit:

fonctionnement de la **motorisation** dans les conditions suivantes:

- les **motorisations** fournies sans **partie entraînée** sont mises en fonctionnement avec la **charge assignée**;
- les **motorisations** fournies avec une **partie entraînée** sont mises en fonctionnement avec la **partie entraînée** installée conformément aux instructions

#### 3.1.101

##### **charge assignée**

couple ou force attribué à la **motorisation** par le fabricant

#### 3.1.102

##### **durée de fonctionnement assignée**

durée de fonctionnement ininterrompu, attribuée à la **motorisation** par le fabricant

Note 1 à l'article: Au cours d'un fonctionnement ininterrompu, la **motorisation** peut inverser son sens de fonctionnement.

#### 3.1.103

##### **nombre assigné de cycles de fonctionnement**

nombre de cycles ininterrompus, attribué à la **motorisation** par le fabricant

### 3.5 Définitions relatives aux types d'appareils

#### 3.5.101

##### **motorisation**

moteur et tous les composants qui commandent le mouvement de la **partie entraînée**

Note 1 à l'article: Les engrenages, les dispositifs de commande, les freins et les composants destinés à la transmission de puissance entre la **motorisation** et la **partie entraînée** sont des exemples de composants.

### 3.7 Définitions relatives aux composants de sécurité

#### 3.7.101

##### **interrupteur sans verrouillage**

dispositif à action maintenue qui déclenche et maintient le mouvement de la **motorisation** tant que la commande manuelle est actionnée par l'utilisateur

### 3.8 Définitions relatives à des sujets divers

#### 3.8.101

##### **partie entraînée**

partie mobile, telle que volet, store ou rideau, dont le mouvement est commandé par la **motorisation**

## 4 Exigences générales

L'article de la Partie 1 s'applique.

## 5 Conditions générales d'essais

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

#### 5.10 Addition:

*Lorsqu'un essai doit être réalisé avec une **partie entraînée**, la **partie entraînée** spécifiée pour l'installation avec cette **motorisation** qui donne les conditions les plus défavorables pour l'essai est utilisée. La **motorisation** est réglée conformément aux instructions.*

*La **partie entraînée** peut être simulée par une charge artificielle.*

*Lorsque la **motorisation** est fournie avec la **partie entraînée**, la **partie entraînée** peut être simulée par une charge artificielle, à l'exception des essais des 20.104.1, 20.104.2, 20.104.3, 20.104.4 et 20.104.5.*

*Lorsque la **motorisation** est fournie sans la **partie entraînée**, la **partie entraînée** doit être simulée par une charge artificielle ou par une **partie entraînée** représentative, en tenant compte des instructions du fabricant pour représenter les conditions les plus défavorables, à l'exception des essais des 20.104.1, 20.104.2, 20.104.3, 20.104.4 et 20.104.5.*

*Les essais des 20.104.1, 20.104.2, 20.104.3, 20.104.4 et 20.104.5 doivent être réalisés avec la **partie entraînée** alimentée, ou avec une **partie entraînée** représentative, en tenant compte des instructions du fabricant pour représenter les conditions les plus défavorables.*

*Un exemple de charge artificielle pour les **parties entraînées** enroulables est donné à la Figure 102.*

## 6 Classification

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

### 6.2 Addition:

**Les motorisations** ou les parties des **motorisations** qui sont exposées aux conditions extérieures doivent être au moins IPX4.

Lorsque des **parties entraînées** sont exposées aux conditions extérieures, les **motorisations** ou les parties des **motorisations** couvertes par la **partie entraînée** doivent être au moins IPX4.

## 7 Marquage et instructions

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

### 7.1 Addition:

Les **motorisations** fournies sans **partie entraînée** doivent porter les marquages suivants:

- la **charge assignée**, en newtons (N) ou en newtons-mètres (Nm);
- la **durée de fonctionnement assignée**, en minutes, à moins que la **motorisation** ne soit prévue pour un fonctionnement continu.

Les **motorisations** fournies avec une **partie entraînée** doivent porter le marquage du **nombre assigné de cycles de fonctionnement**, à moins que la **motorisation** ne soit prévue pour un fonctionnement continu.

### 7.12 Modification:

Remplacer le cinquième alinéa par ce qui suit:

Les instructions pour les appareils qui comportent une **partie de la classe III** alimentée par une **partie d'alimentation amovible** doivent indiquer que l'appareil doit uniquement être utilisé avec l'alimentation fournie avec l'appareil ou la **partie d'alimentation amovible** répertoriée dans les instructions.

### Addition:

Les instructions concernant les **motorisations** avec **partie entraînée** doivent indiquer que le **nombre assigné de cycles** ne doit pas être dépassé.

Les instructions doivent comporter, en substance, la mise en garde suivante:

**MISE EN GARDE:** Instructions importantes de sécurité. Il est important pour la sécurité des personnes de suivre ces instructions. Conserver ces instructions.

Les instructions doivent comporter, en substance, les indications suivantes, lorsqu'elles sont applicables:

- ne pas laisser les enfants jouer avec les dispositifs de commande fixes. Mettre les télécommandes hors de portée des enfants;
- vérifier fréquemment l'installation pour déceler tout mauvais équilibrage ou tout signe d'usure ou de détérioration des câbles, des ressorts et des fixations. Ne pas utiliser l'appareil si une réparation ou un réglage est nécessaire;

- lors de l'utilisation d'un interrupteur sans verrouillage, vérifier que les autres personnes sont tenues à distance;
- ne pas faire fonctionner le système, lorsque des opérations d'entretien, telles que le nettoyage des vitres, sont en cours à proximité.

Les instructions doivent comporter des détails sur la façon d'utiliser le dispositif de débrayage manuel, le cas échéant.

Les instructions pour les **motorisations** commandées automatiquement doivent comporter, en substance, l'indication suivante:

Déconnecter la motorisation de l'alimentation électrique ou mettre les commandes automatiques à l'arrêt lorsque des opérations d'entretien, telles que le nettoyage des vitres, sont en cours à proximité.

#### 7.12.1 Addition:

Les instructions d'installation doivent comporter, en substance, la mise en garde suivante:

**MISE EN GARDE:** Instructions importantes de sécurité. Suivre toutes les instructions, dans la mesure où une installation incorrecte peut entraîner des blessures graves.

Les instructions d'installation doivent indiquer le type de **partie entraînée** avec lequel la **motorisation** est destinée à être utilisée.

Elles doivent spécifier les parties mécaniques nécessaires pour coupler la **motorisation** à la **partie entraînée**.

NOTE 101 Pour tenir compte des variantes de **parties entraînées**, la liste des parties mécaniques peut être proposée sur un site web, dans un catalogue ou dans une documentation de référence similaire.

Les instructions d'installation doivent comporter, en substance, les indications suivantes, lorsqu'elles sont applicables:

- avant d'installer la motorisation, enlever tous les cordons ou composants inutiles et mettre hors service tout équipement qui n'est pas nécessaire pour un fonctionnement motorisé;
- installer l'organe de manœuvre du dispositif de débrayage manuel à une hauteur inférieure à 1,8 m au-dessus du sol ou de tout autre niveau d'accès.

Les instructions doivent comporter les informations suivantes:

- l'organe de manœuvre d'un **interrupteur sans verrouillage** doit être en vue directe de la **partie entraînée**, mais éloigné des parties mobiles. Il doit être installé à une hauteur minimale de 1,5 m au-dessus du sol ou de tout autre niveau d'accès;
- si des parties de la **motorisation** sont destinées à être installées à une hauteur d'au moins 850 mm, 1,8 m ou 2,5 m au-dessus du sol ou de tout autre niveau d'accès conformément au 8.1.1, au Tableau 101, au 20.2, au 20.104, au B.22.3 ou au B.22.4, la hauteur minimale pour l'installation de la **motorisation**.

Pour les **motorisations** fournies sans **partie entraînée**, les instructions d'installation doivent comporter, en substance, les indications suivantes:

- le fait que les caractéristiques de la **partie entraînée** doivent être compatibles avec la **charge assignée** et la **durée de fonctionnement assignée**;
- le diamètre minimal du tube nécessaire pour l'installation des **motorisations** tubulaires;
- la façon de monter la **partie entraînée** et de régler les dispositifs de commande.

Les instructions d'installation des stores doivent indiquer qu'une distance horizontale d'au moins 0,4 m doit être maintenue entre la **partie entraînée** complètement déployée et tout objet fixe.

Pour les **motorisations** qui sont des **parties de la classe III** et qui sont destinées à être alimentées par une **partie d'alimentation amovible** qui n'est pas fournie avec la **motorisation**, les instructions d'installation doivent comporter, en substance, l'indication suivante:

La motorisation doit uniquement être utilisée avec les unités d'alimentation amovibles énumérées dans les présentes instructions.

Pour les **motorisations** destinées à être raccordées de façon permanente à des conducteurs fixes, fournies avec un connecteur distinct afin de faciliter l'installation et d'effectuer le raccordement au réseau, les instructions doivent comporter, en substance, le texte suivant:

Utiliser uniquement le connecteur fourni lors de l'installation de la motorisation.

#### 7.15 Addition:

Le marquage des **motorisations** tubulaires peut être caché après installation. Les marquages doivent également être fournis avec les instructions. En outre, le marquage relatif au nom, à la marque commerciale ou à la marque d'identification du fabricant ou du fournisseur responsable et la référence du modèle ou du type peuvent également être extraits d'une étiquette, par exemple une étiquette à code à barres, visible lorsque l'appareil est installé.

## 8 Protection contre l'accès aux parties actives

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

### 8.1.1 Remplacement:

*L'exigence du 8.1 s'applique à toutes les positions de l'appareil lorsqu'il est mis en fonctionnement comme en usage normal.*

*Le calibre d'essai B, le calibre d'essai 18 et le calibre d'essai 19 de l'IEC 61032 sont appliqués avec une force qui ne dépasse pas 1 N l'appareil étant dans toutes les positions possibles. Le calibre d'essai est appliqué à travers les ouvertures, à toute profondeur admise par le calibre, et il est tourné ou plié avant, pendant et après l'insertion à travers l'ouverture dans toute position. Si l'ouverture ne permet pas l'entrée du calibre, la force appliquée sur le calibre en position droite est portée à 20 N lorsque le calibre B est utilisé ou à 10 N lorsque le calibre d'essai 18 ou le calibre d'essai 19 sont utilisés. Si le calibre d'essai pénètre alors dans l'ouverture, l'essai est répété, le calibre étant en position pliée.*

*Pendant les essais avec le calibre d'essai B, toutes les **parties amovibles** sont retirées, à l'exception des lampes. Toutefois, lors de la mise en place ou du retrait de lampes, la protection contre le contact avec les **parties actives** du culot de lampe doit être assurée.*

*Pendant les essais avec le calibre d'essai 18 et le calibre d'essai 19 de l'IEC 61032, l'appareil doit être entièrement assemblé comme en usage normal, sans qu'aucune partie ne soit retirée.*

*Le calibre d'essai 19 de l'IEC 61032 n'est pas appliqué aux parties des **motorisations** qui sont situées à une hauteur supérieure à 850 mm au-dessus du sol ou de tout autre niveau d'accès en usage normal.*

*Le calibre d'essai 18 de l'IEC 61032 n'est pas appliqué aux parties des **motorisations** dont les instructions précisent que celles-ci doivent être montées à plus de 1,8 m au-dessus du sol ou de tout autre niveau d'accès.*

*Il ne doit pas être possible de toucher des **parties actives** ou des **parties actives** protégées uniquement par laque, émail, papier ordinaire, coton, film d'oxyde, billes ou matériau d'étanchéité, à l'exception des résines autodurcissantes, avec le calibre d'essai B, le calibre d'essai 18 ou le calibre d'essai 19, selon le cas.*

## 8.2 Addition:

L'**isolation principale** et les parties séparées des **parties actives** par l'**isolation principale** peuvent être touchées pendant le réglage, si un **outil** est nécessaire pour accéder aux moyens de réglage.

## 9 Démarrage des appareils à moteur

L'article de la Partie 1 ne s'applique pas.

## 10 Puissance et courant

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

### 10.1 Modification:

*Au lieu de déterminer la valeur moyenne, la valeur maximale de la puissance est déterminée, sans tenir compte de l'effet du courant d'appel.*

### 10.2 Modification:

*Au lieu de déterminer la valeur moyenne, la valeur maximale du courant est déterminée, sans tenir compte du courant d'appel.*

## 11 Échauffements

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

### 11.3 Addition:

*Lorsque les **surfaces accessibles** extérieures sont suffisamment planes et que l'accès le permet, le calibre d'essai de la Figure 103 est utilisé pour mesurer les échauffements des **surfaces accessibles** extérieures spécifiées dans le Tableau 101. Le calibre est appliqué sur la surface avec une force de  $4\text{ N} \pm 1\text{ N}$  de manière à établir le meilleur contact possible entre le calibre et la surface. Le mesurage est effectué après une durée de contact de 30 s.*

*Le calibre peut être maintenu en place à l'aide d'une pince de laboratoire sur statif ou d'un dispositif analogue. Tout instrument de mesure qui donne les mêmes résultats que le calibre peut être utilisé.*

### 11.7 Modification:

Remplacer le premier alinéa par ce qui suit:

*Les **motorisations** pour fonctionnement continu sont soumises à des cycles de fonctionnement consécutifs jusqu'à établissement des conditions de régime.*

*Les autres **motorisations** sont mises en fonctionnement comme suit:*

- les **motorisations** fournies sans **partie entraînée** sont mises en fonctionnement sans périodes de repos pendant la **durée de fonctionnement assignée**, mais pendant au moins 4 min;*