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Edition 3.0 2016-04

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 des 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

FOREWORD

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This part of International Standard IEC 60335 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

This third edition cancels and replaces the second edition published in 2002 including its Amendment 1 (2004) and its Amendment 2 (2008). It constitutes a technical revision.

The principal changes in this edition as compared with the second edition of IEC 60335-2-97 are as follows (minor changes are not listed):

– Deleted "rolling" from the title and modified the scope to cover appliance types other than shutters, awnings, and blinds that are operated in a rolling way;
– Revised 19.13 to allow drives to obtain a safe position;
– Added 19.101 to provide a new abnormal test for drives with rated operating time;

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– Added 20.104.4 to establish a test intended to cover horizontal movement (non-rolling) drive parts;
– Added 20.104.5 to provide an additional test to cover rolling grills to address the risk of being lifted;
– Modified 22.46 and Annex R to introduce software requirements for programmable electronic circuits used to comply with Clause 20;
– Added 22.101 to introduce a requirement to prevent inadvertent adjustments that would lead to unsafe application of drives;
– Added examples of swing shutters and sliding shutters in Figure 101.

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

FDIS	Report on voting
61/5111/FDIS	61/5141/RVD

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

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

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the fifth edition (2010) 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: Safety 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.

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

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

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may 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 the Amendment 2 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.

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 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** in question over and above the general requirements.

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

NOTE 2 Horizontal and generic standards 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.

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.

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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 International Standard 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**.

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 be supplied with a **driven part**.

Drives not intended for normal household use but that nevertheless may 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 knowledge

  prevents 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** intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;
– in many countries, additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour 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 rolling doors (IEC 60335-2-103);

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– **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, *Environmental testing – Part 2: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1.9 *Replacement:*
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

3.101
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.

3.102
driven part
movable part, such as a shutter, awning or blind, that is operated by the **drive**

3.103
rated load
torque or force assigned to the **drive** by the manufacturer

3.104
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
rated number of operating cycles
number of uninterrupted cycles assigned to the **drive** by the manufacturer

3.106
biased-off switch
hold to run device that initiates and maintains the **drive** movement only as long as the manual control is actuated

4 General requirement

This clause of Part 1 is applicable.

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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.*

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 *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;

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– 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 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;
– 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;
– 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.

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.

7.15 *Modification:*

The marking of tubular **drives** may be concealed after installation.

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.2 *Modification:*

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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.

11.7 *Replacement:*

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.*

12 Void

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:*

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*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:*

*After each test it shall stop with the **driven part** in a safe position after a maximum of one **cycle** of operation, or if the **drive** can still be operated normally it shall comply with the requirements of 20.101 to 20.104.*

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:*

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