
Varnost gospodinjskih in podobnih električnih aparatov - 2-95. del: Posebne zahteve za pogon dvizhnih garažnih vrat za stanovanjsko rabo (IEC 60335-2-95:1998; spremenjen)

Safety of household and similar electrical appliances - Part 2-95: Particular requirements for drives for vertically moving garage doors for residential use (IEC 60335-2-95:1998, modified)

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EUROPEAN STANDARD

EN 60335-2-95

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2001

ICS 29.120.01;91.090

English version

Safety of household and similar electrical appliances
Part 2-95: Particular requirements for drives for
vertically moving garage doors for residential use
(IEC 60335-2-95:1998, modified)

Sécurité des appareils
électrodomestiques et analogues
Partie 2-95: Règles particulières pour
les motorisations de portes de garage à
ouverture verticale, pour usage résidentiel
(CEI 60335-2-95:1998, modifiée)

Sicherheit elektrischer Geräte für den
Hausgebrauch und ähnliche Zwecke
Teil 2-95: Besondere Anforderungen für
Antriebe von Garagentoren mit
Senkrechtbewegung zur Verwendung
im Wohnbereich
(IEC 60335-2-95:1998, modifiziert)

This European Standard was approved by CENELEC on 2001-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of the International Standard IEC 60335-2-95:1998, prepared by the IEC Technical Committee 61, was submitted to CENELEC enquiry in June 1998. The comments were discussed during the Pamplona meeting in June 1999 when it was decided to submit a draft for EN 60335-2-95 to the Unique Acceptance Procedure.

This draft was circulated in October 1999 but did not receive sufficient support. The comments were discussed during the Kristiansand meeting in June 2000 when it was decided to submit a second draft for EN 60335-2-95 to the voting procedure. This draft was circulated in February 2001 and was approved by CENELEC as EN 60335-2-95 on 2001-09-01.

The following dates are applicable:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2002-09-01
- date on which national standards conflicting with the EN have to be withdrawn (dow) 2004-09-01

This standard has to be used in conjunction with EN 60335-1, Safety of household and similar electrical appliances, Part 1: General requirements. It was established on the basis of the 1994 edition of that standard. Amendments and revisions of part 1 have also to be taken into account and the dates when such changes become applicable will be stated in the relevant amendment or revision of part 1.

This part 2 supplements or modifies the corresponding clauses of EN 60335-1, so as to convert it into the European Standard: Safety requirements for electric drives for vertically moving garage doors for residential use.

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 of part 1 is to be adapted accordingly.

Subclauses and figures which are additional to those in part 1 are numbered starting with 101.

There are no special national conditions causing a deviation from this European Standard other than those listed in annex ZA in EN 60335-1.

There are no national deviations from this European Standard other than those listed in annex ZB in EN 60335-1.

NOTE - 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 2. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

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p NOTE - In this document p is used in the margin to indicate instructions for preparing the printed version.

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Introduction

An investigation by CENELEC TC 61 has shown that all risks from products within the scope of this standard are fully covered by the Low Voltage Directive, 73/23/EEC. If the product has mechanical moving parts, a risk assessment in accordance with the Machinery Directive, 89/392/EEC, has shown that the risks are mainly of electrical origin and consequently this directive is not applicable. However, the relevant essential safety requirements of the Machinery Directive are covered by this standard together with the principal objectives of the Low Voltage Directive.

Endorsement notice

The text of the International Standard IEC 60335-2-95:1998 was approved by CENELEC as a European Standard with common modifications as given below.

COMMON MODIFICATIONS

1 Scope

- p Add to note 4: "or to wicket doors".
- p Note 6, add after the first dashed item:
 - drives for garage doors higher than 3,5 m;
 - drives that are activated automatically.

2 Definitions

- p 2.101 In the note, delete the word "inherent".
- p 2.102 Replace the text by "Void".
- p 2.103 Replace the text by "Void".
- p Add:

2.Z101

entrapment protection system

part of the **drive** that provides protection against entrapment

NOTE 1 An **entrapment protection system** may consist of one or more devices, such as pressure sensitive edges, passive infrared and active light sensing devices.

NOTE 2 - An **entrapment protection system** may be incorporated in the motor assembly or be installed separately.

NOTE 3 - A **biased-off switch** may be used as an **entrapment protection system**.

2.Z102

rated operating time

duration of uninterrupted sequence of operating cycles assigned to the **drive** by the manufacturer

NOTE - An operating cycle consists of an opening and closing movement of the door.

2.Z103

rated number of operating cycles

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

4 General conditions for the tests

p 4.2 Replace the addition by:

*When a test has to be carried out with a door, the door specified for installation with the **drive** which provides the most unfavourable condition for the test is used. The **drive** is adjusted in accordance with the instructions.*

p Add:

4.7 *Addition:*

*If **drives** are intended to operate beyond the ambient temperature range of +5 °C to +40 °C, the tests of clause 20 are carried out at the most unfavourable marked temperature.*

6 Classification

p 6.2 Replace the addition by:

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

7 Marking and instructions

p 7.1 Replace the addition by:

Drives shall be marked with the minimum and maximum ambient temperatures in which they are intended to operate.

Drives supplied without a door shall be marked with:

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

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

p Add:

7.6

Addition: <http://standards.iteh.ai/catalog/standards/sist/e0f08baa-d924-4557-b0fb-7e128575727f/sist-en-60335-2-95-2002>



Upper limit of temperature (ISO 7000/0533)



Lower limit of temperature (ISO 7000/0534)

p 7.12 Delete the fourth and sixth dashed items.

p Add to the seventh dashed item:

and, if applicable, state that activation of the manual release may cause uncontrolled movement of the door if the springs are weak or broken or if the door is out of balance.

p Add:

For **drives** incorporating a pressure sensing system, the instructions for use shall include the substance of the following:

Each month, check that the drive reverses when the door contacts a 50 mm high object placed on the ground. Adjust if necessary and check again since an incorrect adjustment may present a hazard.

p Add:

7.Z101 If the **drive** is intended to be installed at a height of at least 2,5 m above the floor or other access level, the packaging shall be marked accordingly. This information shall also be given in the instructions for installation.

Compliance is checked by inspection.

p 7.12.1 In the first paragraph, delete "including any non-inherent protection device".

p Replace the first dashed item by:

- before installing the drive, remove all unnecessary ropes or chains and disable any equipment which is not needed after installation of the drive.

p In the last dashed item, replace "40 mm" by "50 mm" and add "(for **drives** incorporating a pressure sensing system)".

p Add the following dashed items:

- after installation, ensure that the parts of the door do not extend over public footpaths or roads;
- after installation, ensure that the drive prevents or stops the opening movement when the door is loaded with a mass of 20 kg, fixed centrally on the bottom edge of the door (for **drives** that can be used with doors having openings larger than 50 mm in diameter).

p Add: [SIST EN 60335-2-95:2002](https://standards.iteh.ai/catalog/standards/sist/e0f08baa-d924-4557-b0fb-7e128575727f/sist-en-60335-2-95-2002)
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7.15 Addition:

When it is not practical for the marking to be visible after the **drive** has been installed, the marking shall also be included in the instructions.

p 7.101 Replace the second paragraph and the note by:

The text may be replaced by the warning sign shown in figure 102.

p 7.102 Replace "**Drives**" by "**Drives** incorporating a pressure sensing system" and replace "40 mm" by "50 mm".

11 Heating

p 11.7 Replace the text by:

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

Other drives are operated as follows:

- *drives supplied without a door are operated without rest periods for the **rated operating time** but for not less than three cycles of operation or 4 min, whichever is longer;*
- *drives supplied with a door are operated without rest periods for the **rated number of operating cycles** but for not less than three cycles of operation.*

15 Moisture resistance

p Replace the text by:

This clause of part 1 is applicable except as follows:

15.1.2 Addition:

IPX4 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 rev/min.

19 Abnormal operation

p Add:

19.1 Addition:

Compliance is also checked by the test of 19.Z101.

p 19.10 Replace the text by:

Addition:

The test is continued for one cycle of operation if this is longer.

p Add:

19.11.2

Addition:

*If the drive can be operated when any of the fault conditions are simulated, the tests of 20.Z101 to 20.Z103 are carried out, the drive however being supplied at **rated voltage**.*

The average forces specified in 20.Z103.1 may be exceeded but they shall not be greater than 600 N during the first 2 s after the force has exceeded 150 N, and shall not be greater than 150 N thereafter.

p 19.13 Delete the addition.

p Add:

19.Z101 *Drives marked with a **rated operating time** or a **rated number of operating cycles** are supplied at **rated voltage** and operated continuously under **normal operation**.*

During the test the winding temperatures shall not exceed the values specified in 19.9.

20 Stability and mechanical hazards

p **20.102** Replace the text by "Void".

p **20.103** Replace the text by "Void".

p **20.104** Replace the text by "Void".

p **20.105** Replace the text by "Void".

p **20.106** Replace the text by "Void".

p **20.107** Replace the text by "Void".

p Add:

20.Z101 *Drives controlled by a **biased-off switch** shall stop when the actuating member of the switch is released.*

Compliance is checked by the following test.

*The **drive** is installed with a door and supplied at the most unfavourable voltage between 0,94 and 1,06 times **rated voltage**. It is operated to close the door.*

When the actuating member of the switch is released, the bottom edge of the door shall stop before it has moved more than 50 mm.

The test is repeated during the opening movement of the door.

The requirement for the door to stop within a distance of 50 mm only applies if the closing force exerted by the door exceeds 150 N, as measured in 20.Z103.1.

20.Z102 *Drives incorporating an **entrapment protection system** with sensing devices which prevent the door coming into contact with an obstacle shall not cause injury resulting from a moving door.*

Compliance is checked by the following test.

*The **drive** is installed with a door, the force exerted by the **drive** being set at maximum in accordance with the instructions for use. The **drive** is supplied at the most unfavourable voltage between 0,94 and 1,06 times **rated voltage**.*

An obstacle having dimensions of approximately 200 mm x 300 mm, a height of 700 mm and a mass of 20 kg \pm 0,5 kg is placed on the ground under the closing door in the most unfavourable orientation.

NOTE - The obstacle is normally made of rough wood and painted white but other materials and colours may be used to simulate the most unfavourable conditions.

The **drive** is operated to close the door. The door shall stop or reverse its movement without contacting the obstacle.

~~The test is repeated with the obstacle rotated at a speed not greater than 15 rev/min and then while it is moved under the closing door at a speed of 3 m/s \pm 0,6 m/s.~~

The tests are repeated with the obstacle placed on its side so that its height is 200 mm.

The obstacle, in its vertical position, is then raised in increments up to the height of the door, but not higher than 2,5 m. At each increment, the **drive** is operated to close the door. The door shall stop or reverse its movement without contacting the obstacle.

The obstacle, in its vertical position, is placed at any location next to the closed door. The **drive** is operated to open the door. The door shall stop or reverse its movement without contacting the obstacle.

20.Z103 Drives incorporating an **entrapment protection system** with sensing devices which rely on the door contacting an obstacle shall not cause injury resulting from a moving door.

Compliance is checked by the test of 20.Z103.1 for a closing movement and, if the **drive** is supplied with a door, by the test of 20.Z103.2 for an opening movement.

20.Z103.1 The **drive** is installed with a door, the force exerted by the **drive** being set at maximum in accordance with the instructions for use. The **drive** is supplied at the most unfavourable voltage between 0,94 and 1,06 times **rated voltage**

The **drive** is operated to close the door from the fully open position and the **entrapment protection system** shall limit the vertical component of the closing force to

- 150 N during the first 5 s after the force has exceeded 25 N,
- 25 N thereafter;

or

- 400 N during the first 0,75 s after the force has exceeded 150 N,
- 150 N during a further period of 4,25 s,
- 25 N thereafter;

or

- 600 N during the first 2 s after the force has exceeded 150 N,
- 150 N thereafter.

The force is measured by means of an instrument which 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 which is connected to an amplifier having a rise and fall time not exceeding 5 ms. The measuring instrument shall be accurate within 5 %.

The force is measured on the bottom edge of the door at the following heights above the ground:

- 50 mm,
- 300 mm,
- 500 mm,
- 2 500 mm, or 300 mm below the maximum opening height of the door if this is less than 2 800 mm.

At each height, the force is measured at the following locations:

- in the centre of the bottom edge of the door,
- 200 mm from each end of the bottom edge of the door.

The test is carried out three times and the average closing force is calculated for each location.

If the measured force exceeds 400 N, the following test is carried out to detect stationary and moving obstacles.

An obstacle having dimensions of approximately 80 mm x 300 mm and a height of 100 mm is placed on the ground and centrally across the door opening.

The **drive** is operated to close the door. The door shall reverse its movement when detecting the obstacle.

The test is repeated with the obstacle positioned at 100 mm from each end of the door opening in turn.

A cylindrical obstacle, having a diameter of 50 mm and a length of 850 mm, is suspended by one end 900 mm above the ground and centrally in the door opening.

The **drive** is operated to close the door and the cylinder is swung across the door opening from an angle of 45°. The **entrapment protection system** shall detect the obstacle and cause the door to reverse its movement.

The force exerted by the **drive** is then set at the maximum in accordance with the instructions for installation.

The closing force is measured again and shall not exceed

- 600 N during the first 2 s after the force has exceeded 150 N,
- 150 N thereafter.

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20.Z103.2 Drives intended to be used with a door having openings in which a 50 mm diameter cylinder can be inserted are subjected to an opening test, the door being provided with a load. The force exerted by the **drive** is set at maximum in accordance with the instructions for use. The load has dimensions of approximately 200 mm x 200 mm x 200 mm, a mass of 20 kg, and is fixed centrally to the outside of the door with one edge adjacent to the bottom edge of the door.

The **drive** is supplied at the most unfavourable voltage between 0,94 and 1,06 times **rated voltage** and operated to open the door. If the bottom edge of the door moves more than 500 mm, the load is replaced by a test piece having dimensions of approximately 200 mm x 300 mm, a height of 700 mm and a mass not exceeding 20 kg, with the 300 mm edge adjacent to the bottom edge of the door.

The **drive** is again operated to open the door. The movement of the door shall stop before the test piece comes into contact with the lintel.

20.Z104 **Entrapment protection systems** shall provide an adequate level of protection in the event of a failure within the system.

Compliance is checked by the following test, unless the **entrapment protection system** is a **biased-off switch**.

The **drive** is installed with a door and supplied at **rated voltage**. The **drive** is operated to close the door. During the movement, a short circuit or open circuit is simulated in the system or installation wiring.

Unless the **entrapment protection system** continues to operate normally, the door shall stop moving or the movement of the door shall only be controlled by a supplementary **biased-off switch** after the door has completed its movement.

The test is repeated during the opening movement of the door.

If the **entrapment protection system** continues to operate normally, the test is repeated with an additional fault simulated.

NOTE - It may be necessary to simulate several faults before the test is completed.

20.Z105 A mechanical fault in the **drive** shall not result in a hazardous operation.

Compliance is checked by inspection and if necessary by test.

The inspection shall evaluate which parts can affect the safety of operation and whether they are likely to break or become loose. These parts may be within the **drive** or used for connecting the **drive** to the door.

NOTE - Examples of parts which are evaluated are screws, pins, shafts, wheels, chains and supporting parts.

If the inspection cannot determine whether the **drive** will continue to operate normally or stop its movement when the part has failed, the following test is carried out.

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The **drive** is installed with a door, the force exerted by the **drive** being set at maximum in accordance with the instructions for use. The **drive** is supplied at the most unfavourable voltage between 0,94 and 1,06 times **rated voltage**.

The faults are introduced one at a time and the **drive** is operated as in normal use.

Unless the **drive** and the door continue to operate normally,

- the **drive** shall stop operating by the end of the cycle,
- further operation shall not be possible,
- the speed of the door shall not increase by more than 20 %.