SLOVENSKI STANDARD

SIST EN 61011:1999/A2:2002

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Generatorji impulzov za električne ograje - Varnostne zahteve za omrežno napajane generatorje impulzov za električne ograje (IEC 61011:1989/popravek jun. 1993 + A1:1991 + A2:1993)

Electric fence energizers - Safety requirements for mains - operated electric fence energizers - Amendment A2 (IEC 61011:1989/Corrigendum 1993+A1:1991+a2:1993)

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Amendment A2 to the English version of EN 61011
(includes amendment AA)

Electric fence energizers
Safety requirements for mains-operated electric fence energizers

(IEC 1011 : 1989/corrigendum 1993 + A1 : 1991 + A2 : 1993)

Electrificateurs de clôtures
Règles de sécurité pour électrificateurs de clôtures fonctionnant sur le réseau
(CEI 1011 : 1989/corrigendum 1993 + A1 : 1991 + A2 : 1993)

Elektrozaungeräte
Sicherheitsbestimmungen für Elektrozaungeräte mit Netzanschluß
(IEC 1011 : 1989/Corrigendum 1993 + A1 : 1991 + A2 : 1993)

This amendment A2 modifies the European Standard EN 61011 : 1992. It was approved by CENELEC on 8 March 1994. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

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Subclause 2.2.8

Replace the definition for type M attachment by the following:

Type M attachment denotes a method of attachment such that the flexible cable or cord can be easily replaced without the aid of special purpose tools, by a special cable or cord with, for example, a moulded-on cord guard or crimped terminations or by replacing a part of the energizer incorporating the cord.

Replace the definition for type Y attachment by the following:

Type Y attachment denotes a method of attachment such that the flexible cable or cord can only be replaced by the use of a special purpose tool either for gaining access to the connections or for making the connections.

Type Y attachment may be used either with a common flexible cable or cord, or with a special cable or cord.

Subclause 4.4.2

Replace the second dash of item 8) by the following:

– external independent control of the switching speed of semiconductor devices used as the major pulse switching device by referencing the gate signal of this device to the voltage across it, the switching speed shall be varied in the range 0.1 Hz to two times the supply frequency or 100 Hz whichever is the greater in approximately a 1:2:5 progression sequence over three decades, or

Add the following explanatory note after item 8):

Details of a simple comparator circuit which has been found suitable for controlling the switching speed of the major pulse switching device are given in Appendix Q.

Subclause 7.1

Replace the eighth indent by:

— designation for degree of protection against harmful ingress of solid foreign objects/water, not less than IP44;

Subclause 7.4

Delete the second sentence of the third paragraph.

Add the following new paragraph after the existing second paragraph:

The symbols for Class II construction, output (Fence) and output (Earth) shall be in accordance with IEC 417.

Add at the end of the subclause, the following explanation:

Additional symbols are allowed provided they do not give rise to misunderstanding.

Subclause 7.5

Add the following new paragraph:

The lettering of the marking shall have a height of at least 3 mm and the symbols a height of at least 6 mm.

Subclause 7.9

Add the following requirement:

The instruction sheet shall also contain the substance of the following information:

- **for energizers with a type M attachment:**

  If the supply cord of this energizer is damaged it shall be replaced by the special cord (quote the appropriate part reference);

- **for energizers with a type Y attachment:**

  If the supply cord of this energizer is damaged it shall only be replaced by a repair shop appointed by the manufacturer, because special purpose tools are required.

Subclause 7.11

Add the following explanation:

The petroleum spirit to be used for the test is aliphatic solvent hexane having a maximum aromatics content of 0,1 % by volume, a kauri-butanol value of 29, an initial boiling point of approximately 65 °C, a dry point of approximately 69 °C and a specific mass of approximately 0,68 kg/l.

Delete the explanation regarding the revision of the test for durability of marking.

Subclause 8.1

Replace the first sentence of the requirement by the following:

Energizers shall be so constructed that there is adequate protection against accidental contact with live parts, other than the output terminals, with basic insulation or with metal parts separated from live parts by basic insulation only.

Replace the third paragraph of the requirement by the following:

The enclosure of the energizer shall have no openings, other than those necessary for the use and working of the energizer, giving access to live parts, basic insulation and to parts separated from live parts by basic insulation only.

Replace the last sentence of the test specification by the following:

It shall not be possible to touch basic insulation or metal parts separated from live parts by basic insulation only, with the test finger shown in figure 1.

Subclause 10.1

Replace, in the second line of item 6), "Item 3 of this sub-clause" by "Item 1 of this subclause in parallel with a resistor having a non-inductive resistance of 500 Ω."

Subclause 11.5

In footnote [5] of the table delete the reference to subclause 30.2.

Subclause 14.1

Replace this subclause by the following:

Attention is drawn to the fact that compliance with the requirements concerning the limits for interference effects generated by the energizer as specified in the CISPR recommendations and when measured in accordance with the relevant CISPR specifications, will in most cases ensure that the energizer has the required degree of radio and television interference suppression.

Under particularly unfavourable conditions, national authorities may require a greater degree of suppression than recommended by the CISPR, which may necessitate the fitting of additional suppressors; it is therefore recommended that this be taken into account when designing the appliance.

Subclause 15.1

Replace, in the first paragraph, "for which creepage distances and clearances are specified in subclause 29.1" by the following:

"which could result in a reduction of creepage distances and clearances below the values specified in 29.1."

Subclause 15.1

Replace the penultimate paragraph by the following:

Immediately after the treatment for energizers protected against the effects of immersion the energizer shall withstand the electric strength test specified in 16.3 and inspection shall show that water has not entered those spaces of the energizer where live parts are located.

Subclause 15.2

Replace the penultimate paragraph by the following:

The energizers are then subjected to the appropriate tests for appliances protected against splashing water (IPX4) or appliances protected against the effects of immersion (IPX7), as detailed in IEC 529.

Subclause 16.3

Replace the first dash of item 1 in the table and the test voltage value 4 500 by the following:

— for all insulated Class II energizers (reinforced insulation)	*3 750*

Replace the first sentence of the first footnote in the table by the following:

The value 2 U_o is a peak value equal to twice the maximum peak value of the output voltage measured during the test of subclause 10.1.

Subclause 21.1

Replace the last sentence of the third paragraph by the following:

The sample as a whole is rigidly supported against a plane surface and three blows are applied to every point of the enclosure that is likely to be weak.

Add, after the third paragraph, the following new paragraph:

For the calibration of the spring-operated impact-test apparatus, see IEC 817.

22 Construction

Subclause 22.11

Replace this subclause by the following:

Asbestos shall not be used in the construction of energizers, unless the liberation of dust of impregnated asbestos or of asbestos fibres into the surrounding air is adequately prevented.

Compliance is checked by inspection.

The intention of this requirement is to avoid risk associated with the inhalation of fibres or dust of asbestos.

Subclause 22.21

Delete this subclause.

Subclause 22.22

Replace the explanatory matter by the following:

Material complying with the test of Subclause 30.5 is considered to be suitable for the relevant working voltage and for outdoor conditions.

Add, after subclause 23.7, the following new subclause:

23.8 Stranded conductors shall not be consolidated by lead-tin soldering where they are subject to contact pressure, unless the clamping means is so designed that there is no risk of bad contact due to cold flow of solder.

Compliance is checked by inspection.

Consolidation of stranded conductors by lead-tin soldering is allowed if spring terminals are used; securing the clamping screws alone is not considered adequate.

Soldering of the tip of a stranded conductor is allowed.

24 Components

Subclause 24.1

Delete the second explanation.

Add the following new paragraphs at the end of this subclause:

Automatic controls not complying with IEC 730 shall be tested according to this standard and additionally according to 11.3.5 to 11.3.8 and clause 17 of IEC 730.

The tests according to IEC 730 are carried out under the conditions occurring in the energizer during the tests of clause 19.

For the tests of Clause 17 of IEC 730 the number of cycles to be used is:

- ***for thermostats: 10 000 cycles of operation;***
- ***for temperature limiters: 10 000 cycles of operation;***
- ***for self-resetting thermal cut-outs: 200 cycles of operation;***
- ***for manually reset non-self-resetting thermal cut-outs: 10 cycles of operation.***
- ***for non-self-resetting thermal cut-outs requiring replacement of a part: three cycles of operation, a new part being fitted for each operation.***

Subclause 24.2

Replace the text of the first dash by the following:

- **switches or automatic controls in flexible cables or cords;**

25 Supply connection and external flexible cables and cords

Subclause 25.5

Add the following explanation:

Soldering of the tip of a stranded conductor is allowed.

Subclause 25.8

Replace, the text of the first dash in the paragraph commencing For type M and Y attachments *by the following:*

– **a separate insulating lining fixed to the cord anchorage;**

Subclause 25.9

Replace the line reading

– **to fixed wiring and for type X attachment, in addition:**

by the following:

– **to fixed wiring and for type X and type M attachments, in addition:**

Subclause 26.3

Replace the last explanation by the following:

Requirements for screwless terminals are given in IEC 685-2-1.

Subclause 26.4

Add the following to the text preceding the table:

unless the energizer is so designed that only one type of cable or cord can be fitted, in which case the terminals shall be suitable for the connection of that cable or cord.

Subclause 28.1

Add the following footnote in the table:

For screws in engagement with a thread of insulating material and which are likely to be tightened by the user the torque is increased by 20 %.

Replace the last line of the first column of the table by:

over 5,3

Subclause 28.2

Replace the test specification by the following:

Compliance is checked by inspection.

Subclause 29.1

Delete the superscript [1] in the heading of column 1 of the table.

Add a superscript [1)] to the heading in the third column of the table.

Replace footnote [1)] of the table by the following;

1) The clearances specified do not apply across a spark gap or similar device which is necessary for the correct functioning of the energizer.

Delete the text following the table.

Subclause 29.2

Add the following new paragraphs to the requirement:

Moreover this requirement does not apply if the supplementary insulation or the reinforced insulation is inaccessible and meets one of the following conditions:

- the maximum temperature rise determined during the tests of clause 19 does not exceed the permissible value specified in subclause 11.5;
- the insulation, after having been conditioned for 7 days (168 h) in an oven maintained at a temperature equal to 50 K in excess of the maximum temperature rise determined during the tests of Clause 19, withstands an electric strength test as specified in subclause 16.3, this test being made on the insulation both at the temperature occurring in the oven and approximately at room temperature.

The insulation between the input winding and the output windings of transformers used for the isolation of the fence circuit, is considered to be reinforced insulation. However, the thickness of this insulation need not be 2 mm if it is applied in thin sheet form and consists of at least three layers. In this case, when two thirds of the total number of layers or, if this does not result in a whole number, the nearest whole number of layers below two thirds of the total number of layers, are placed in contact, they shall withstand the electric strength test prescribed for the relevant insulation in 16.3. During this test, the test voltage is applied between the outer surfaces of the layers.

30 Resistance to heat, fire and tracking

Replace this clause by the following:*

30.1 External parts of non-metallic materials and parts of insulating material retaining live parts in position, the deterioration of which might cause the energizer to fail to comply with this standard, shall be sufficiently resistant to heat.

Compliance is checked by subjecting a specimen of the relevant parts to a ball-pressure test, which is made by means of the apparatus shown in figure 10.

Before starting the test, the specimen is kept for 24 h in an atmosphere having a temperature between 15 °C and 35 °C and a relative humidity between 45 % and 75 %.

The specimen is placed on a support in such a way that its upper surface is horizontal and the spherical tip of the test apparatus having a diameter of 5 mm is pressed against this surface with a force of 20 N. The thickness of the specimen is at least 2,5 mm; this thickness being obtained, if necessary, by placing two or more specimens together.

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* The tests specified in this clause are based on the present IEC standards dealing with this subject. Other concepts for determining the resistance to fire, such as preselection testing, are under consideration by the IEC and will be studied when available.

The test is made in a heating cabinet at a temperature the value of which is the higher of 40 K plus the maximum temperature rise determined during the test of Clause 11, with a tolerance of ± 2 K and :

75 °C ± 2 °C for external parts.
125 °C ± 2 °C for parts retaining live parts in position.

However, for parts of thermoplastic material providing supplementary insulation or reinforced insulation, the test is made at a temperature which is 25 K in excess of the maximum temperature rise determined during the tests of Clause 19, with a tolerance of ± 2 K, if this will lead to a higher temperature.

Before the test is started, the test apparatus and the support on which the specimen is placed are brought to the temperature specified.

After 1 h, the test apparatus is removed from the specimen, which is then cooled within 10 s, to approximately room temperature by immersion in cold water. The diameter of the impression caused by the spherical tip is then measured and shall not exceed 2 mm.

For coil formers, only those parts which support or retain in position terminals or terminations are subjected to the test.

The test is not made on parts of ceramic material.

30.2 Parts of non-metallic material shall be adequately resistant to ignition and to spread of fire.

This requirement does not apply to decorative trims, knobs and other parts not likely to be ignited or to propagate flames originating from inside the appliance.

Compliance is checked by the tests of 30.3 and 30.4.

30.3 *Separately moulded specimens of the relevant parts are subjected to the burning test referred to in Appendix J.*

If separately moulded specimens are not available, or if there is no evidence that the material withstands the burning test, or if the separately moulded specimens do not withstand that test, the glow-wire test referred to in Appendix K is made on the relevant parts of the appliance, the test being made at a temperature of 650 °C.

30.4 *Connections supported by parts of insulating material and carrying a current during normal operation exceeding 0,5 A are subject to the bad-connection test with heaters referred to in Appendix L. If this test cannot be made due to the design of the connection, the parts of insulating material supporting the connection are subjected to the glow-wire test referred to in Appendix K, the test being made at a temperature of 750 °C. In this case, the test is also carried out on parts in contact with or in close proximity to the connection.*

The test is not carried out on parts supporting welded connections.

"In close proximity" may generally be considered as a distance not exceeding 3 mm.

During the application of the glow-wire, the height and duration of flames are measured.

In addition for parts which withstand the glow-wire test, but which flame during the application of the glow-wire, the surrounding parts are subject to the needle-flame test referred to in Appendix M for the measured duration of the flame if:

- *they are positioned within a distance equal to the height of the flame and*
- *they are likely to be impinged upon by the flame.*

However, parts shielded by a separate barrier which meets the needle flame test are not tested.

The needle-flame test is not carried out on parts which are made of a material classified as FV-0 or FV-1 according to IEC 707. The sample of material submitted to the test of IEC 707 shall be no thicker than the relevant part.

Parts likely to be impinged upon by the flame are generally considered to be those within the envelope of a vertical cylinder of a radius of 10 mm and a height equal to the height of the flame, positioned above the point of application of the glow-wire.

If parts do not withstand the glow-wire test or the bad-connection test with heaters, the needle-flame test referred to in Appendix M is made on all other parts of non-metallic material which are within a distance of 50 mm. However, parts shielded by a separate barrier which meets the needle-flame test are not tested.

The needle-flame test is not carried out on parts which are made of a material classified as FV-0 or FV-1 according to IEC 707. The sample of material submitted to the test of IEC 707 shall be no thicker than the relevant part.

30.5 Insulating materials across which a tracking path may occur between live parts of different polarity, shall have adequate resistance to tracking, taking into account the severity of its duty conditions.

For parts of insulating material used under severe or extra-severe duty conditions compliance is checked by the proof tracking test referred to in Appendix N.

For parts of insulating material used under normal duty conditions and parts of ceramic material, no tracking test is made.

For parts of insulating materials used under severe duty conditions, the test voltage is 175 V. If these specimens do not withstand this test and there is no hazard other than fire, surrounding parts are subjected to the needle-flame test referred to in Appendix M.

For parts of insulating material used under extra-severe duty conditions, the test voltage is 250 V. If the specimens do not withstand this test, but withstand the test made with a test voltage of 175 V, and there is no hazard other than fire, surrounding parts are subjected to the needle-flame test referred to in Appendix M.