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Household and similar electrical appliances - Safety - Part 2-76: Particular requirements for electric fence energizers

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IEC SC 61H : SAFETY OF ELECTRICALLY-OPERATED FARM APPLIANCES	
SECRETARIAT: New Zealand	SECRETARY: Mr Derek R. Johns
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input checked="" type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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TITLE:

Household and similar electrical appliances - Safety - Part 2-76: Particular requirements for electric fence energizers

NOTE FROM TC/SC OFFICERS:

This CDV is fragment 1 of two fragments. It updates the standard to align with Edition 5.2 of Part 1 and is based on the following documents:

61H/311/DC and 61H/314A/INF – see 61H/319/RM

61H/325/DC and 61H/332A/INF – see 61H/337/RM

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –**
Part 2-76: Particular requirements for electric fence energizers

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

1 This part of International Standard IEC 60335 has been prepared by subcommittee 61H:
2 Safety of electrically-operated farm appliances, of IEC technical committee 61: Safety of
3 household and similar electrical appliances.

4 This third edition cancels and replaces the second edition published in 2002, its Amendment 1
5 (2006) and its Amendment 2 (2013). This edition constitutes a technical revision.

6 The principal changes in this edition as compared with the second edition of IEC 60335-2-76
7 are as follows (minor changes are not listed):

8 TO BE INSERTED AT FDIS STAGE

9

10

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

FDIS	Report on voting
61H/xxx/FDIS	61H/xxx/RVD

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

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

15 This Part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its
16 amendments. It was established on the basis of the fifth edition (2010) of that standard.

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

18 This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to
19 convert that publication into the IEC standard: Safety requirements for electric fence
20 energizers.

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

24 NOTE 2 The following numbering system is used:

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

29 NOTE 3 The following print types are used:

- 30 – requirements: in roman type
- 31 – *test specifications: in italic type*
- 32 – notes: in small roman type.

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

35 The committee has decided that the contents of the base publication and its amendments will
36 remain unchanged until the maintenance result date indicated on the IEC web site under
37 "http://webstore.iec.ch" in the data related to the specific publication. At this date,
38 the publication will be

- 39 • reconfirmed,
- 40 • withdrawn,
- 41 • replaced by a revised edition, or
- 42 • amended.

43 National committees are requested to note that for this publication the new stability date will
44 be 2021

45 THIS TEXT IS INCLUDED FOR THE INFORMATION OF NATIONAL COMMITTEES AND
46 WILL BE DELETED AT THE PUBLICATION STAGE

47 NOTE 3 The attention of National Committees is drawn to the fact that equipment manufacturers and testing
48 organizations may need a transitional period following publication of a new, amended or revised IEC publication in
49 which to make products in accordance with the new requirements and to equip themselves for conducting new or
50 revised tests.

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

53 The following differences exist in the countries indicated below:

- 54 – 6.101: Only energy limited energizers are allowed (Austria, Denmark, France, Germany, Netherlands,
55 Norway, Switzerland and United Kingdom).

56 **Note of the Secretary:** National Committees are asked to reconfirm their in some countries
57 notes. They will be deleted unless reconfirmed.

58

iTeh STANDARD PREVIEW (standards.iteh.ai)

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59

INTRODUCTION

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

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

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

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

74 NOTE 1 Throughout this publication, when "Part 1" is mentioned, it refers to IEC 60335-1.

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

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

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

82 NOTE 3 Horizontal and generic standards covering a hazard are not applicable since they have been taken into
83 consideration when developing the general and particular requirements for the IEC 60335 series of standards. For
84 example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as
85 ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.

86

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-76: Particular requirements for electric fence energizers

1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of **electric fence energizers**, the **rated voltage** of which is not more than 250 V and by means of which **fence** wires in agricultural, domestic or feral animal control **fences** and **security fences** may be electrified or monitored.

NOTE 101 Examples of **electric fence energizers** coming within the scope of this standard are:

- **mains-operated energizers**;
- **battery-operated electric fence energizers suitable for connection to the mains**, as shown in Figure 101;
- **electric fence energizers** operated by non-rechargeable batteries either incorporated or separate.

This standard does not in general take into account

- the use of appliances by young children or infirm persons without supervision;
- the playing with appliances by children.

NOTE 102 Attention is drawn to the fact that

- for appliances intended to be used 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, the national water supply authorities and similar authorities.

NOTE 103 This standard does not apply to

- electromagnetically coupled animal trainer collars;
- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);
- separate battery chargers (IEC 60335-2-29);
- electric fishing machines (IEC 60335-2-86);
- electric animal-stunning equipment (IEC 60335-2-87);
- appliances for medical purposes (IEC 60601).

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

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

ISO 3864-1, *Graphical symbols -- Safety colours and safety signs -- Part 1: Design principles for safety signs and safety markings*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1.1 *Addition:*

For **type D energizers**, the **rated voltage** of the **energizer** is the **rated voltage** for battery supply.

130 **3.1.6** *Addition:*

131 For **battery-operated electric fence energizers** not for connection to the mains, it is the
132 average input current assigned to the **energizer** by the manufacturer.

133 **3.1.9** *Replacement:*134 **normal operation**

135 operation of the appliance under the following conditions: the **electric fence energizer** is
136 operated as in normal use when connected to the supply, with no load connected to the
137 output terminals

138 **3.6.3** *Addition:*

139 Note 101 to entry: It also includes terminals for the connection of the battery and other metal parts in a battery
140 compartment that become accessible when replacing batteries even with the aid of a **tool**.

141 **3.6.4** *Replacement:*142 **live part**

143 conductive part that may cause an electric shock

144 **3.101**145 **electric fence energizer**

146 appliance that is intended to deliver periodically voltage impulses to a **fence** connected to it

147 Note 1 to entry: **Electric fence energizers** are hereinafter also referred to as **energizers**.

148 **3.102**149 **mains-operated energizer**

150 **energizer** designed for direct connection to the mains

151 **3.103**152 **battery-operated energizer suitable for connection to the mains**153 **energizer**

154 – operated by batteries and having, or being designed for connection to, facilities for
155 charging these batteries from the mains, or

156 – designed for operation from the mains and from batteries

157 **3.104**158 **type A energizer**

159 **battery-operated energizer suitable for connection to the mains** consisting of an impulse
160 generating circuit, a battery charging circuit and a battery, the impulse generating circuit
161 being connected to the mains or the battery when the energizer is in operation

162 Note 1 to entry: **Type A energizers** are shown schematically in Figure 101.

163 **3.105**164 **type B energizer**

165 **battery-operated energizer suitable for connection to the mains** consisting of an impulse
166 generating circuit, a battery charging circuit and a battery, the impulse generating circuit
167 being connected to the battery and disconnected from the battery charging circuit and the
168 mains when the **energizer** is in operation. For recharging the battery the impulse generating
169 circuit is disconnected and rendered inoperable

170 Note 1 to entry: **Type B energizers** are shown schematically in Figure 101.

171 **3.106**172 **type C energizer**

173 **battery-operated energizer suitable for connection to the mains** consisting of an impulse
174 generating circuit and a battery, the impulse generating circuit being connected to the mains
175 or the battery when the energizer is in operation, and where it is necessary to remove the
176 battery to recharge it using a separate battery charger or, in the case of a non-rechargeable
177 battery, to replace it with a new battery

178 Note 1 to entry: **Type C energizers** are shown schematically in Figure 101.

179 **3.107**

180 **type D energizer**

181 **battery-operated energizer suitable for connection to the mains** consisting of an impulse
182 generating circuit intended to be powered by a battery, the impulse generating circuit being
183 connected to the battery when the **energizer** is in operation and the **energizer** or the battery
184 being connected to a separate battery charger for recharging the battery

185 Note 1 to entry: Examples of **Type D energizers** are shown schematically in Figure 101.

186 Note 2 to entry: Examples of separate supply units are power supply units and uninterruptible power suppli

187 **3.108**

188 **battery-operated energizer**

189 **energizer** deriving its energy solely from batteries or other sources of energy and not
190 designed for connection to the mains

191 **3.109**

192 **fence circuit**

193 all conductive parts or components within an **energizer**, that are connected or intended to be
194 connected galvanically to the output terminals

195 **3.110**

196 **earth electrode**

197 metal structure that is driven into the ground near an **energizer** and connected electrically to
198 the output earth terminal of the **energizer**, and that is independent of other earthing
199 arrangements

200 **3.111**

201 **prospective peak voltage** (standards.iteh.ai)

202 peak output voltage of the impulse generator specified in Clause 14 that would be obtained
203 with the **energizer** not connected to the test circuit

204 **3.112**

205 **rated voltage for battery supply**

206 voltage for battery supply, for **type A energizers**, **type B energizers** and **type D energizers**
207 assigned to the **energizer** by the manufacturer

208 **3.113**

209 **rated voltage range for battery supply**

210 voltage range for battery supply, for **type A energizers**, **type B energizers** and **type D**
211 **energizers** assigned to the **energizer** by the manufacturer, expressed by its lower and upper
212 limits

213 **3.114**

214 **impulse duration**

215 duration of that part of the impulse that contains 95 % of the overall energy and is the shortest
216 interval of integration of $i(t)$ that gives 95 % of the integration of $i(t)$ over the total impulse

217 Note 1 to entry: $i(t)$ is the impulse current as a function of time.

218 **3.115**

219 **output current**

220 r.m.s. value of the **output current** per impulse calculated over the impulse duration

221 **3.116**

222 **standard load**

223 load consisting of a non-inductive resistor of $500 \Omega \pm 2,5 \Omega$ and a variable resistor that is
224 adjusted so as to maximize the energy per impulse or **output current** in the 500Ω resistor,
225 as applicable. The variable resistor is connected in series or parallel with the 500Ω resistor,
226 whichever gives the more unfavourable result

- 227 **3.117**
228 **fence**
229 barrier for animals or for security purposes, comprising one or more conductors, such as
230 metal wires, rods or rails
- 231 **3.118**
232 **electric fence**
233 barrier that includes one or more electric conductors, insulated from earth, to which electric
234 pulses are applied by an **energizer**
- 235 **3.119**
236 **connecting lead**
237 electric conductor, used to connect the **energizer** to the **electric fence** or the **earth electrode**
- 238 **3.120**
239 **electric animal fence**
240 **electric fence** used to contain animals within or exclude animals from a particular area
- 241 **3.121**
242 **electric security fence**
243 a fence used for security purposes that comprises an **electric fence** and a physical barrier
244 electrically isolated from the **electric fence**
- 245 **3.122**
246 **physical barrier**
247 barrier not less than 1,5 m high intended to prevent inadvertent contact with the **pulsed**
248 **conductors** of the **electric fence**
- 249 Note 1 to entry: **Physical barriers** are typically constructed from vertical sheeting, rigid vertical bars, rigid mesh,
250 rods or chain-wire mesh.
- 251 **3.123**
252 **public access area**
253 any area where persons are protected from inadvertent contact with **pulsed conductors** by
254 a **physical barrier**
- 255 **3.124**
256 **pulsed conductors**
257 conductors that are subjected to high voltage pulses by the **energizer**
- 258 **3.125**
259 **secure area**
260 area where a person is not separated from **pulsed conductors** below 1,5 m by a **physical**
261 **barrier**
- 262 **4 General requirement**
- 263 This clause of Part 1 is applicable.
- 264 **5 General conditions for the tests**
- 265 This clause of Part 1 is applicable except as follows.
- 266 **5.2 Modification:**
- 267 *Replace the test specification by the following:*
- 268 *The tests are made on two **energizers** as delivered, one being subjected to all the tests with*
269 *the exception of that of Clause 18, and the other to the tests of 22.108 and Clause 18.*
270 *However, the tests of Clauses 22 to 28 may be made on separate samples.*
- 271 *For **type A energizers** and **type C energizers**, an additional sample is required for the test of*
272 *Clause 18.*
- 273 *Addition:*