



BSI Standards Publication

Household and similar electrical appliances — Safety

Part 2-76: Particular requirements for electric fence energizers

National foreword

This British Standard is the UK implementation of EN IEC 60335-2-76:2021 incorporating amendment A11. It is derived from IEC 60335-2-76:2018 incorporating corrigendum 1:2018. It supersedes BS EN 60335-2-76:2005+A2:2015, which will be withdrawn on 20 September 2024.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to text carry the number of the CENELEC amendment. For example, text altered by CENELEC amendment A11 is indicated by A11 A11.

The UK participation in its preparation was entrusted to Technical Committee CPL/61/1, Motorised appliance group.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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English Version

Household and similar electrical appliances - Safety - Part 2-76:
Particular requirements for electric fence energizers
(IEC 60335-2-76:2018 + COR1:2018)

Appareils électrodomestiques et analogues - Sécurité -
Partie 2-76: Règles particulières pour les électrificateurs de
clôtures
(IEC 60335-2-76:2018 + COR1:2018)

Sicherheit elektrischer Geräte für den Hausgebrauch und
ähnliche Zwecke - Teil 2-76: Besondere Anforderungen für
Elektrozaungeräte
(IEC 60335-2-76:2018 + COR1:2018)

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document EN IEC 60335-2-76:2021 consists of the text of IEC 60335-2-76:2018 prepared by IEC/TC 61 "Safety of household and similar electrical appliances".

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2022-09-20
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-09-20

This document supersedes EN 60335-2-76:2005 and all of its amendments and corrigenda (if any).

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This document is read in conjunction with EN IEC 60335-2-76:2021/A11:2021.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 60335-2-76:2018 was approved by CENELEC as a European Standard.

European foreword to amendment A11

This document (EN IEC 60335-2-76:2021/A11:2021) has been prepared by CLC/TC 61 "Safety of household and similar electrical appliances".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2022-09-20
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2024-09-20

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

The numbering system for European clauses, subclauses, notes, tables, figures and annexes that are additional to those in the IEC standard are prefixed with the letter "Z".

This document is read in conjunction with EN IEC 60335 2 76:2021.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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

This bilingual version (2019-02) corresponds to the monolingual English version, published in 2018-06.

This third edition cancels and replaces the second edition published in 2002, Amendment 1:2006 and Amendment 2:2013. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- the text has been aligned with Edition 5.2 of Part 1;
- additional requirements for security fence energizers have been introduced (Clauses 3, 7, 19, 22, Figures and Annex BB);

- specific requirements for battery operated energizers have been moved to Annex S.

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

FDIS	Report on voting
61H/366/FDIS	61H/367/RVD

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

The French version of this standard has not been voted upon.

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

A list of all parts in the IEC 60335 series, published 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. 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 electric fence energizers.

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 associated noun are also in bold.

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 this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

The following differences exist in the countries indicated below:

6.101: Only energy limited energizers are allowed (All EU and EFTA counties).

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

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

The contents of the corrigendum of November 2018 have been included in this copy.

IMPORTANT – The 'colour inside' logo on the cover page of this publication 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.

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.

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

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

NOTE 2 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 3 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.

 With this European amendment A11 the standard EN 60335-2-76:2005+A1:2006+A2:2015+A11:2008 +A12:2010 is superseded.

This standard is not linked to any European legislation.

This European amendment A11 supplements or modifies the corresponding clauses of the standards below:

- EN 60335-1:2012+A11:2014+ A13:2017+A1:2019+A14:2019+A2:2019 (Part 1)
- EN IEC 60335-2-76:2021 (Part 2) 

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 part of IEC 60335 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 and Figure 102;
- **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 young children.

NOTE 102 Attention is drawn to the fact that

- for appliances intended to be used 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.

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

IEC 60320-3, *Appliance couplers for household and similar general purposes – Part 3: Standard sheets and gauges*

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 Definitions relating to physical characteristics

3.1.1 *Addition:*

Note 1 to entry: For **type D energizers**, the **rated voltage** of the **energizer** is the **rated voltage** for battery supply.

Replacement:

3.1.9 **normal operation**

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

3.1.101 **prospective peak voltage**

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

3.1.102 **rated voltage for battery supply**

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

3.1.103 **rated voltage range for battery supply**

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

3.1.104 **impulse duration**

duration of that part of the impulse that contains 95 % of the overall energy and is the shortest interval of integration of $I^2(t)$ that gives 95 % of the integration of $I^2(t)$ over the total impulse

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

3.1.105 **output current**

RMS value of the **output current** per impulse calculated over the impulse duration

3.5 Definitions relating to types of appliances

3.5.101 **electric fence energizer**

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

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

3.5.102 **mains-operated energizer** **energizer** designed for direct connection to the mains

3.5.103

battery-operated energizer suitable for connection to the mains energizer

- operated by batteries and having, or being designed for connection to, facilities for charging these batteries from the mains, or
- designed for operation from the mains and from batteries

3.5.104

type A energizer

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

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

3.5.105

type B energizer

battery-operated energizer suitable for connection to the mains consisting of an impulse generating circuit, a battery charging circuit and a battery, the impulse generating circuit being connected to the battery and disconnected from the battery charging circuit and the mains when the **energizer** is in operation.

Note 1 to entry: For recharging the battery, the impulse generating circuit is disconnected and rendered inoperable.

Note 2 to entry: **Type B energizers** are shown schematically in Figure 101.

3.5.106

type C energizer

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

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

3.5.107

type D energizer

battery-operated energizer suitable for connection to the mains consisting of an impulse generating circuit intended to be powered by a battery, or a **detachable supply unit**, when the **energizer** is in operation. The impulse generating circuit or the battery may be connected to a **detachable supply unit** with or without incorporated battery charging circuitry for recharging the battery when the **energizer** is in operation.

Note 1 to entry: Examples of **Type D energizers** are shown schematically in Figure 102.

3.5.108

battery-operated energizer

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

3.5.109

security electric fence energizer

energizer containing **fence circuits** that are intended to periodically deliver voltage impulses into **electric security fences**

Note 1 to entry: A **security electric fence energizer** is hereinafter also referred to as a **security energizer**.

3.5.110**independently timed security energizer**

security energizer that includes an internal **impulse timing signal source** to set the timing of the periodic voltage impulses it delivers to an **electric security fence**

Note 1 to entry: An **independently timed security energizer** is hereinafter also referred to as **an independent security energizer**.

3.5.111**dependently timed security energizer**

security energizer that is dependent on an external **impulse timing signal** to set the timing of the periodic voltage impulses it delivers to an **electric security fence**

Note 1 to entry: A **dependently timed security energizer** is hereinafter also referred to as **dependent security energizer**.

Note 2 to entry: Some types of **security energizer** may be configured either as an **independent security energizer** or a **dependent security energizer** at the time of installation.

3.5.112**security energizer group**

one or two **security energizers** with a group total of two **fence circuits** used to supply adjacent **electric security fences** in a **security energizer fence system** that allows the two **fence circuits** to be contacted at the same time

Note 1 to entry: The **fence circuits** in a **security energizer group** may be galvanically connected.

3.5.113**type R security energizer**

security energizer with one or two **fence circuits** that is suitable for use in a **type R security energizer group**

3.5.114**type R security energizer group**

security energizer group containing only **type R security energizers**

3.5.115**type S security energizer**

security energizer with one or two **fence circuits** that is suitable for use in a **type S security energizer group**

3.5.116**type S security energizer group**

security energizer group containing at least one **type S security energizer**

Note 1 to entry: A **type S security energizer group** may contain a **type R security energizer**.

3.6 Definitions relating to parts of an appliance**3.6.3 Addition:**

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

Replacement:

3.6.4**live part**

conductive part that may cause an electric shock

3.6.101

fence circuit

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

3.6.102

security energizer impulse timing signal

signal that is used to determine the timing of the periodic voltage impulses delivered by a **security energizer** to an **electric security fence**

Note 1 to entry: A **security energizer impulse timing signal** is hereinafter also referred to as an **impulse timing signal**.

Note 2 to entry: Examples of a **security energizer impulse timing signal** include wired (RS-485), wired with latency (internet clock, secure TCP/IP), wireless with latency (LAN, PAN), optical, GPS.

3.6.103

impulse timing signal source

signal source that generates the **impulse timing signal** required by a **dependent security energizer** to set the timing of the periodic voltage impulses it delivers to an **electric security fence**

Note 1 to entry: An **impulse timing signal source** may be used by one or more **dependent security energisers**.

Note 2 to entry: An example of an **impulse timing signal source** is an impulse signal from an adjacent **electric security fence** that is powered by an **independent security energizer** that belongs to the same **security energizer fence system**.

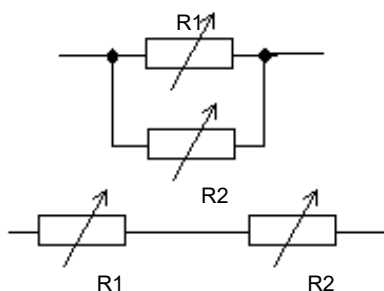
Note 3 to entry: An impulse signal from an adjacent **electric security fence** powered by an **independent security energizer** not belonging to the same **security energizer fence system** is not an example of a possible **impulse timing signal source**.

3.8 Definitions relating to miscellaneous matters

3.8.101

standard load

A11 load consisting of the non-inductive resistor R1 between 50 Ω and 500 Ω giving the most severe condition and a non-inductive variable resistor R2 that is adjusted so as to maximize the energy per impulse or, when applicable, the cumulated duration of peak current exceeding 20 A in the non-inductive resistor R1, whichever gives the more unfavourable result. The non-inductive variable resistor R2 is connected in series or parallel with the non-inductive resistor R1, whichever gives the more unfavourable result



Key

R1 non inductive resistor between 50 Ω and 500 Ω

R2 non inductive variable resistor **A11**

3.8.102

earth electrode

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

3.8.103

pulsed conductors

conductors that are subjected to high voltage pulses by the **energizer**

3.8.104

connecting lead

electric conductor, used to connect the **energizer** to the **electric fence** or the **earth electrode**

3.8.105

fence

barrier for animals or for security purposes, comprising one or more conductors, such as metal wires, rods or rails

3.8.106**electric fence**

barrier that includes one or more electric conductors, insulated from earth, to which electric pulses are applied by an **energizer**

3.8.107**electric animal fence**

electric fence used to contain animals within or exclude animals from a particular area

3.8.108**electric security fence**

fence used for security purposes that comprises an **electric fence** and a physical barrier electrically isolated from the **electric fence**

3.8.109**physical barrier**

barrier not less than 1,5 m high intended to prevent inadvertent contact with the **pulsed conductors** of the **electric fence**

Note 1 to entry: **Physical barriers** are typically constructed from vertical sheeting, rigid vertical bars, rigid mesh, rods or chain-wire mesh.

3.8.110**public access area**

any area where persons are protected from inadvertent contact with **pulsed conductors** by a **physical barrier**

3.8.111**secure area**

area where a person is not separated from **pulsed conductors** below 1,5 m by a **physical barrier**

3.8.112**security energizer fence system**

electric security fence installation where the **fences** are energized by one or more **security energizers** containing one or more **security energizer groups** that can be **type R security energizer groups** or **type S security energizers groups**

Note 1 to entry: An **independent impulse timing signal source** used in a **security energizer fence system** may be used to set the timing of **dependent security energizers** in multiple **security energizer groups**.

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.

5.2 Modification:

Replace the test specification by the following:

*The tests are made on two **energizers** as delivered, one being subjected to all the tests with the exception of that of Clause 18, and the other to the tests of 22.108 and Clause 18. However, the tests of Clauses 22 to 28 may be made on separate samples.*

*For **type A energizers** and **type C energizers**, an additional sample is required for the test of Clause 18.*

Addition:

NOTE 101 Where **electronic circuits**, **electronic components** or other devices are normally encapsulated, specially prepared samples can be used for the tests of 19.11 and 19.101.

5.3 Addition:

The measurements of 22.108 shall be carried out before the tests of Clause 14.

*If any **electronic component** has been damaged during the tests of Clause 14, the tests of Clause 19 are made twice, once before and once after the damaged **electronic components** have been replaced by new **electronic components**.*

5.5 Addition:

*The **energizer** is mounted in a normal position such that the deviation from the position for which it is designed does not exceed 15°. However, if the **energizer** is provided with means for adjustment to the normal position, such as a spirit level, the **energizer** shall be adjusted to within ±2° of the normal position.*

*The earthing terminal of the **fence circuit** is connected to earth. However, if there is no indication as to which of the output terminals is to be connected to earth, the terminal that gives the most unfavourable result is earthed.*

5.8.1 Addition:

*For **type A energizers**, **type B energizers**, **type C energizers** and **type D energizers** where the terminals for the connection of the battery have no indication of polarity, the more unfavourable polarity of the voltage source replacing the battery shall be applied.*

*For **mains-operated energizers** and **battery-operated energizers suitable for connection to the mains**, the reference source impedance of the mains supply shall be $0,4 \Omega + j0,25 \Omega$.*

5.101 *All **energizers** are tested as **motor-operated appliances**.*

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Replacement:

Mains-operated energizers and **battery-operated energizers suitable for connection to the mains** shall be **class II** with respect to protection against electric shock.

Compliance is checked by inspection and by the relevant tests.

6.2 Addition:

Energizers shall be of at least IPX4.

 **6.101** *Text deleted* 

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

Type A energizers, type B energizers and type C energizers shall be marked with the **rated voltage for battery supply** or **rated voltage range for battery supply**, in volts.

Energizers A_{11} that are marked with a maximum energy/impulse exceeding 5 J shall also be marked with the corresponding load resistance at which maximum energy/impulse is obtained.

Energizers shall be marked with symbol ISO 7000-0790 (2004-01).

Type R security energizers shall be marked with symbol IEC 60417-6406 (2018-02).

Type S security energizers shall be marked with symbol IEC 60417-6407 (2018-02).

7.6 Addition:

	[symbol IEC 60417-5036 (2002-10)]	dangerous voltage
	[symbol IEC 60417-5017 (2006-08)]	earth; ground
	[symbol IEC 60417-6406 (2018-02)]	time synchronized type R security energizer
	[symbol IEC 60417-6407 (2018-02)]	time synchronized type S security energizer

The symbols for output (**fence**) and output (earth) shall be in accordance with symbols IEC 60417-5036 (2002-10) and IEC 60417-5017 (2006-08) respectively.

7.12 Addition:

Instructions for battery-operated energizers suitable for connection to the mains shall

- include a warning against using non-rechargeable batteries while the **energizer** is powered by mains;
- state that, during charging, vented rechargeable-batteries shall be placed in a well-ventilated area.

Instructions for **type D energizers** shall list accessories made available by the manufacturer.

A_{11} 7.12.1 Addition:

The installation instructions for energizers fitted with polyvinyl chloride sheathed cords shall state that the energizer has to be located in a shelter and must not be handled when the ambient temperature is below +5 °C. A_{11}

7.14 Addition:

The outer diameter of the circle of symbol IEC 60417-6406 (2018-02) and symbol IEC 60417-6407 (2018-02) shall be at least 15 mm.

7.101 Unless the correct mode of connection is obvious or irrelevant, the output terminals of the **energizer**, other than dedicated output earth terminals, shall be clearly and indelibly identified using symbol IEC 60417-5036 (2002-10). Dedicated output earth terminals shall be clearly and indelibly identified using symbol IEC 60417-5017 (2006-08).

Where alternative output terminals are provided, they shall be similarly marked, or marked with the words FULL POWER, REDUCED POWER or REDUCED VOLTAGE, as appropriate.

If a switch to control the output energy is provided, the various positions of the switch shall be marked with the appropriate symbols, or with the words FULL POWER, REDUCED POWER or REDUCED VOLTAGE, as appropriate.

The height of characters in the marking shall not be less than that given by an 18 point font and the symbols shall have a height of at least 6 mm.

Compliance is checked by inspection and measurement.

7.102 For **battery-operated energizers suitable for connection to the mains**, the supply terminals for connection of the battery shall be clearly indicated by symbol IEC 60417-5005 (2002-10) for positive polarity, and by symbol IEC 60417-5006 (2002-10) for negative polarity, unless the polarity is irrelevant.

Compliance is checked by inspection.

7.103 Energizers shall be supplied with instructions that contain the information given in Annex BB regarding

- the installation of **electric fences**;
- the means of connecting the **energizer** to the **electric fence**.

Such information shall contain the substance of the wording given in Clause BB.1 (electric animal fences), Clause BB.2 (electric security fences not supplied from a security energizer group) or Clause BB.3 (electric security fences supplied from a security energizer group), as appropriate.

Energizers intended for use with **electric security fences** may also be supplied with the information given in Annex CC.

Compliance is checked by inspection.

7.104 The instructions for a **security energizer** that is suitable for use in a **security energizer group** shall contain the substance of the following:

- only type R security energizers or type S security energizers can be used in security energizer groups;
- a type S security energizer shall not be used in a type R security energizer group;
- a type R security energizer may be used in a type S security energizer group;
- identification of the model or type reference of security energizers that are permitted to be used in the security energizer group;
- security energizer groups shall only include security energizers that are identified in the instructions;
- the permitted configurations and connections of security energizers that may be used in the security energizer groups;

- identification of the model or type reference of the device producing the impulse timing signal source that is suitable for use in the security energizer group;
- a security energizer fence system must be configured and installed by, or under the responsibility of an authorized installer;
- a security energizer fence system shall be serviced and maintained by, or under the responsibility of an authorized installer;
- after installation, a label shall be attached to each energizer in a security energizer group that provides the authorized installer's name, contact details and the installation date;
- after servicing, a label shall be attached to each energizer in a security energizer group that provides the authorized installer's name, contact details and the service date;
- an authorised installer is a person suitably trained by the manufacturer to be able to safely configure, install and maintain a **security energizer fence system** on the basis of professional training, knowledge, experience and familiarity of the relevant equipment.

The instructions for a **security energizer** that is suitable for use in a **security energizer group** shall

- provide an explanation of the hazards of not using **security energizer groups** in locations where two electric security fences can be contacted at the same time;
- provide an explanation of the hazards of not correctly configuring a **security energizer** when used in a **security energizer group**. These hazards include:
 - receiving a too large impulse;
 - receiving consecutive two impulses that are not spaced apart enough in time;
 - touching an electric security fence whose isolation from the supply mains has been compromised;
- explain the meaning of the time synchronized symbols IEC 60417-6406 (2018-02) and IEC 60417-6407 (2018-02), if they are used;
- provide a general explanation of the safety objectives and technical requirements of a **security energizer group** that can be properly understood by an authorized installer;
- provide a general explanation of the safety objectives and technical requirements of a **security energizer fence system** that can be correctly understood by an authorized installer.

The front section of the instructions shall include the substance of the following warnings:

IMPORTANT WARNINGS

WARNING: These instructions must be fully complied with in every respect

WARNING: A security energizer group must be used at any point where two electric security fences can be contacted by a person at the same time

WARNING: Give special attention to the correct type selection and connection of security energizers used in a security energizer group

WARNING: A security energizer fence system should be checked for safety by an authorized installer prior to operation

DANGER: Failure to comply fully with the instructions could lead to a fatal electric shock

Compliance is checked by inspection.

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.4 Addition:

*The means for the connection of the **fence** is not considered to be a **live part**.*

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.

10.101 For **A₁₁** **energizers** **A₁₁** that are marked with a maximum energy/impulse exceeding 5 J, the value so marked shall not deviate from that delivered by more than $\pm 10\%$ and the load resistance at which it is obtained shall not deviate from the value marked on the **energizer** by more than $\pm 5\%$.

Compliance is checked by the following test.

*The **energizer** is supplied at **rated voltage** or **rated voltage for battery supply**, as appropriate, under conditions of **normal operation** but with a variable resistive load connected across its output terminals.*

*The energy per impulse dissipated in the resistive load connected across the **energizer** output terminals is measured using the measuring arrangement described in 22.108. The resistive load value is measured after it is adjusted to maximize the energy per impulse measured.*

11 Heating

This clause of Part 1 is applicable except as follows.

11.2 Addition:

*For **type A energizers** when connected for mains supply, **type D energizers** when connected for battery charging supply and **type B energizers** when connected for mains supply with battery charge operation, a battery of the largest capacity for which the **energizer** is designed is connected to the terminals for the connection of the battery supply. Before starting the test, the battery is discharged to such an extent that the voltage delivered by the battery does not exceed 0,75 times its nominal value.*

11.5 Replacement:

*The **energizer** is operated under **normal operation**, supplied as follows.*

*A **mains-operated energizer** is supplied with the most unfavourable supply voltage between 0,85 and 1,1 times **rated voltage**.*