

# INTERNATIONAL STANDARD

**IEC**  
**60335-2-87**

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**Safety of household and similar  
electrical appliances –**

**Part 2-87:  
Particular requirements for electric  
animal-stunning equipment**

*Sécurité des appareils électrodomestiques et analogues –*

*Partie 2-87:  
Règles particulières pour les appareils électriques  
d'insensibilisation des animaux*



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For general terminology, readers are referred to IEC 60050: *International Electrotechnical Vocabulary (IEV)*.

For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams*.

\* See web site address on title page.

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –****Part 2: Particular requirements for electric animal-stunning equipment**

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
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- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

<https://www.international-standard.org/standards/iec-60335-2-87-1998>  
International Standard IEC 60335-2-87 has been prepared by subcommittee 61H: Safety of electrically-operated farm appliances, of IEC technical committee 61: Safety of household and similar electrical appliances.

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

FDIS	Report on voting
61H/124/FDIS	61H/129/RVD

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

This 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 third edition (1991) of that standard and its amendment 1 (1994).

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 animal-stunning equipment.

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

NOTE 1 – The following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type;*
- notes: in smaller roman type.

Words in **bold** in the text are defined in clause 2. When a definition of part 1 concerns an adjective, the adjective and the associated noun are also in **bold**.

NOTE 2 – Subclauses, tables and figures which are additional to those in part 1 are numbered starting from 101.

The following additional differences exist in some countries:

- 25.7: Ordinary polyvinyl chloride cords are allowed (Australia, New Zealand).

Withheld

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## SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –

### Part 2: Particular requirements for electric animal-stunning equipment

#### 1 Scope

This clause of part 1 is replaced by:

This standard deals with the safety of **electric animal-stunning equipment** the **rated voltage** of which is not more than 250 V for single-phase appliances and 480 V for other appliances.

This standard is applicable to **electric animal-stunning equipment** for industrial or commercial use, for use on farms or for use in areas where they may be a source of danger to the public.

So far as is practical, this standard deals with the common hazards presented by these types of appliances.

NOTE 1 – Examples of **electric animal-stunning equipment** within the scope of this standard are those used to stun:

- bovines such as cattle, calves, cows, heifers and bulls;
- ovines such as sheep and lambs;
- caprines such as goats;
- cervids such as deer;
- solipeds such as horses, donkeys and mules;
- birds such as chickens, turkeys and guinea fowl;
- porcines such as pigs;
- fur animals such as foxes, chinchilla, rabbits and possums;
- mustelids such as mink and polecats;
- other ruminants such as camels.

NOTE 2 – The following types of **electric animal-stunning equipment** are covered by this standard:

- manual, semi-automatic and automatic.

NOTE 3 – Attention is drawn to the fact that:

- for **electric animal-stunning equipment** intended to be used on board ships, additional requirements may be necessary;
- for **electric animal-stunning equipment** intended to be used in tropical countries, special 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;
- in many countries, additional requirements are specified concerning the humane slaughter of animals.

NOTE 4 – This standard does not apply to:

- 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);
- electric fishing machines (see IEC 60335-2-86);
- electric fence energizers (see IEC 60335-2-76);
- meat tenderizers, carcass immobilizers, carcass stiffeners, spinal discharge equipment or similar equipment.

## 2 Definitions

This clause of part 1 is applicable except as follows:

### 2.2.9 Replacement:

#### normal operation

The **electric animal-stunning equipment** is operated as in normal use when connected to the supply with **electrodes** connected to the output terminals of the **stunning equipment**. An adjustable non-inductive resistor is connected between the **electrodes**. The resistor is adjusted so that **output current** can flow.

### 2.9.3 Addition:

NOTE – It also includes terminals for the connection of the batteries and other metal parts in a battery compartment which become accessible when replacing batteries even with the aid of a **tool**.

### 2.9.4 Replacement:

#### live part

A conductive part which may cause an electric shock.

NOTE – Parts, accessible or not, complying with 8.1.4 are not considered to be **live parts**.

### 2.101

#### electric animal-stunning equipment

Appliance which is designed or used to cause electrocution in an animal by means of an electric current. It may also cause irreversible cardiac arrest.

NOTE – In this standard, for convenience, this term is abbreviated to **stunning equipment**.

### 2.102

#### mains-operated stunning equipment

**Stunning equipment** designed for direct connection to a supply, other than a battery supply or a **safety extra-low voltage** supply.

### 2.103

#### battery-operated stunning equipment

**Stunning equipment** deriving its energy solely from chargeable or non-rechargeable batteries.

### 2.104

#### electrode

Parts of **stunning equipment** which transfer the electric current to the animal.

NOTE – The **stun electrode** is the **electrode** used to apply the stun voltage, the **return electrode** is the other **electrode**.

### 2.105

#### stunning circuit

Conductive parts or components within **stunning equipment**, which are connected or intended to be connected galvanically to the **electrode** terminals.

### 2.106

#### output voltage

Voltage required to sustain the **output current** under **normal operation**.

### 2.107

#### output current

Current in the **stunning circuit** that the **stunning equipment** is designed to supply.



**2.108****biased-off switch**

Switch which automatically returns to the **off position** when its actuating member is released.

**3 General requirement**

This clause of part 1 is applicable.

**4 General conditions for the tests**

This clause of part 1 is applicable except as follows:

**4.8.1 Addition:**

For **battery-operated stunning equipment** where the supply terminals for the connection of the batteries have no indication for polarity, the application of the more unfavourable polarity is used.

4.101 If there is no indication as to which of the output terminals is to be connected to the **stun electrode**, the terminal which gives the most unfavourable result is connected to the return **electrode**.

4.102 Unless otherwise specified, **stunning equipment** is tested as a **motor-operated appliance**.

**5 Void****6 Classification**

This clause of part 1 is applicable except as follows:

**6.1 Replacement:**

**Stunning equipment** which is suitable for connection to the supply mains shall be of **class I, class II or class III** with respect to protection against electric shock.

**Stunning equipment** which is suitable for connection to the supply mains and which is directly connected to the water supply mains shall be of **class I** with respect to protection against electric shock.

**Portable and hand-held stunning equipment** shall be **class II or class III** with respect to protection against electric shock.

*Compliance is checked by inspection and by the relevant tests.*

**6.2 Addition:**

Parts of **stunning equipment** which contain electrical components and which may be cleaned with a water jet according to the instructions, shall be at least of IPX5 construction.

**Hand-held stunning equipment** shall be at least of IPX5 construction.

## 7 Marking and instructions

This clause of part 1 is applicable except as follows:

### 7.1 Addition:

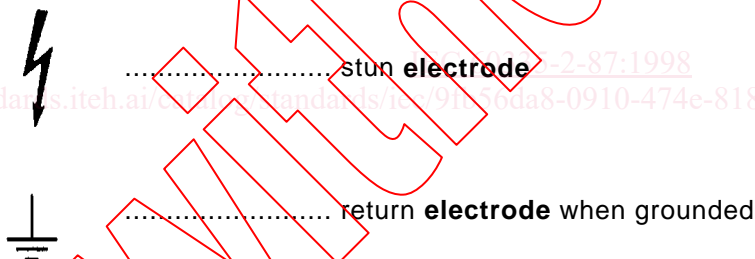
**Stunning equipment** shall be marked with:

- duty cycle, if applicable;
- **output current**;
- no-load **output voltage**;
- warning – "Read full instructions before use";
- a symbol indicating the presence of a dangerous voltage in accordance with symbol number 5036 of IEC 60417-2.  
NOTE – This symbol forms a warning sign for which the rules in ISO 3864 are applicable.
- the stun **electrode** and return **electrode** terminals shall be identified by appropriate symbols where applicable, except if the return **electrode** is not grounded.

**Battery-operated stunning equipment** shall also be marked with:

- the **rated input current** in amperes;
- WARNING – Do not connect to mains-operated equipment.
- the type of battery, unless the type is irrelevant for the operation of the stunning equipment, distinguishing between chargeable and non-rechargeable batteries if necessary.

### 7.6 Addition:



The symbols for stun **electrode** and return **electrode** when grounded shall be in accordance with symbol numbers 5036 and 5017 of IEC 60417-2 respectively.

### 7.8 Addition:

For **battery-operated stunning equipment** the supply terminals for connection of the battery shall be clearly indicated by the symbol "+" or the colour red if of positive polarity, and by the symbol "-" or the colour black if of negative polarity, unless the polarity is irrelevant.