



SLOVENSKI STANDARD

SIST EN 60335-2-87:1999

01-julij-1999

Safety of household and similar electrical appliances – Part 2-87: Particular requirements for electric animal-stunning equipment (IEC 60335-2-87:1998)

Safety of household and similar electrical appliances -- Part 2-87: Particular requirements for electric animal stunning equipment

Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke - Teil 2-87: Besondere Anforderungen für elektrische Tierbetäubungsgeräte

Sécurité des appareils électrodomestiques et analogues -- Partie 2-87: Règles particulières pour les appareils électriques d'insensibilisation des animaux

<https://standards.iteh.ai/catalog/standards/sist/4609c7f5-e68a-4d57-8e08-2b71d1e965d3/sist-en-60335-2-87-1999>

Ta slovenski standard je istoveten z: EN 60335-2-87:1999

ICS:

65.020.30	Živinoreja	Animal husbandry and breeding
-----------	------------	-------------------------------

SIST EN 60335-2-87:1999	en
--------------------------------	-----------

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 60335-2-87:1999](#)

<https://standards.iteh.ai/catalog/standards/sist/4609c7f5-e68a-4d57-8e08-2b71d1e965d3/sist-en-60335-2-87-1999>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60335-2-87

January 1999

ICS 65.060.99

Descriptors: Household electrical appliances, animal stunning equipment, safety requirements, protection against electric shock, fire protection, protection against mechanical hazard

English version

Safety of household and similar electrical appliances
Part 2-87: Particular requirements for electric animal-stunning equipment
(IEC 60335-2-87:1998)

Sécurité des appareils
électrodomestiques et analogues
Partie 2-87: Règles particulières
pour les appareils électriques
d'insensibilisation des animaux
(CEI 60335-2-87:1998)

Sicherheit elektrischer Geräte für den
Hausgebrauch und ähnliche Zwecke
Teil 2-87: Besondere Anforderungen
für elektrische Tierbetäubungsgeräte
(IEC 60335-2-87:1998)

<https://standards.iteh.ai/catalog/standards/sist/4609c7f5-e68a-4d57-8e08-2b71d1e965d3/sist-en-60335-2-87-1999>

This European Standard was approved by CENELEC on 1999-01-01. 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, 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

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

Foreword

The text of document 61H/124/FDIS, future first edition of IEC 60335-2-87 prepared by the SC 61H of the IEC Technical Committee 61, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60335-2-87 on 1999-01-01.

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) 1999-10-01
- date on which national standards conflicting with the EN have to be withdrawn (dow) 2001-10-01

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 animal-stunning equipment.

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, tables 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 to EN 60335-1.

There are no national deviations from this European Standard, other than those listed in annex ZB to 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 of part 1 concerns an adjective, the adjective and the associated noun are also in bold.

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

Introduction

An investigation by CENELEC TC 61 has concluded 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 60335-2-87:1998 was approved by CENELEC as a European Standard without any modification.

CONTENTS

Clause	Page
1 Scope	4
2 Definitions.....	5
3 General requirement	6
4 General conditions for the tests	6
5 Void	6
6 Classification	6
7 Marking and instructions.....	7
8 Protection against access to live parts	9
9 Starting of motor-operated appliances	9
10 Power input and current	9
11 Heating	9
12 Void	10
13 Leakage current and electric strength at operating temperature	10
14 Void	10
15 Moisture resistance	10
16 Leakage current and electric strength	10
17 Overload protection of transformers and associated circuits.....	11
18 Endurance	11
19 Abnormal operation	11
20 Stability and mechanical hazards.....	11
21 Mechanical strength	12
22 Construction.....	12
23 Internal wiring	16
24 Components.....	16
25 Supply connection and external flexible cords	16
26 Terminals for external conductors.....	17
27 Provision for earthing	17
28 Screws and connections	17
29 Creepage distances, clearances and distances through insulation	17
30 Resistance to heat, fire and tracking.....	17
31 Resistance to rusting.....	18
32 Radiation, toxicity and similar hazards	18
Figures.....	19
Annexes	21

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 electroneurosis 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**.*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

5 Void

[SIST EN 60335-2-87:1999](https://standards.iteh.ai/catalog/standards/sist/4609c7f5-e68a-4d57-8e08-2b71d1e965d3/sist-en-60335-2-87-1999)

<https://standards.iteh.ai/catalog/standards/sist/4609c7f5-e68a-4d57-8e08-2b71d1e965d3/sist-en-60335-2-87-1999>

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:

[SIST EN 60335-2-87:1999](https://standards.iteh.ai/catalog/standards/sist/4609c7f5-e68a-4d57-8e08-2b71d1e965d3/sist-en-60335-2-87-1999)

<https://standards.iteh.ai/catalog/standards/sist/4609c7f5-e68a-4d57-8e08-2b71d1e965d3/sist-en-60335-2-87-1999>



..... stun **electrode**



..... return **electrode** when grounded

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.

7.12 *Addition:*

The instructions shall contain the substance of the following:

- for **stunning equipment** parts of which are hand-held, the power supply switch shall be visible from any point that the piece held in the hand may be used;
- for **stunning equipment** parts of which are hand-held, the hand-held sub-assembly when not in use shall be kept in a holder placed alongside the supply unit, or be otherwise suspended at a minimum height of 1,6 m;
- isolate the **stunning equipment** from the power supply when it is not in use.

The instructions for **battery-operated stunning equipment** shall in particular emphasize the warning marked on the **stunning equipment** which states:

WARNING – Do not connect to mains-operated equipment.

The instructions for **class III portable stunners**, shall state that the stunner shall only be used with the isolating transformer with which it is supplied.

7.12.1 *Addition:*

The instructions shall include the substance of the following:

- a wiring diagram;
- recommendations concerning functional tests to be carried out to ensure the continuing correct operation of safety controls and interlocks;
- the stunner shall be disconnected from the power supply during cleaning;
- for **fixed stunning equipment**, the installation shall be integrated into an effective equipotential bonding system;
- parts which are not marked IPX5 shall be installed in a location where they are not likely to be cleaned with the aid of a water jet;
- the stunner shall be installed in a well drained position;
- the **supply cord** shall be placed such that it is not accessible to animals;
- the **stunning equipment** is to be installed according to the relevant sections of the wiring rules and health and safety rules.

NOTE – Attention is drawn to IEC 60364-7-705.

7.101 Hand-pieces of **stunning equipment**, which are detachable from the rest of the **stunning equipment**, shall be marked with:

- name, trade mark or identification mark of the manufacturer or responsible vendor;
- model or type reference of the hand-piece;
- **rated voltage**, **rated current** and duty cycle if applicable;
- IP rating.

Compliance is checked by inspection.

7.14 *Addition:*

The perpendicular height of the triangle containing the symbol indicating the presence of a dangerous voltage shall be not less than 120 mm, however for the warning sign on the hand-piece of **hand-held stunning equipment** the height shall not be less than 20 mm.

8 Protection against access to live parts

This clause of part 1 is applicable except as follows:

8.1.4 Addition:

The **electrodes** are 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.

11 Heating

This clause of part 1 is applicable except as follows:

11.5 Replacement:

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Stunning equipment is operated under **normal operation** supplied as follows:

- for **mains-operated stunning equipment**, supplied with the most unfavourable supply voltage between 0,94 and 1,06 times **rated voltage**;
- for **battery-operated stunning equipment** when it is supplied with the most unfavourable supply voltage between:
 - 0,55 and 1,1 times **rated voltage**, if the **stunning equipment** can be used with non-rechargeable batteries;
 - 0,75 and 1,1 times **rated voltage**, if the **stunning equipment** is designed for use with rechargeable batteries only.

The values specified in table 101 for the internal resistance/cell of the battery shall be taken into account.

Table 101 – Battery source impedance

Supply to the terminals for the connection of the battery	Internal resistance/cell Ω	
	Non-rechargeable batteries	Rechargeable batteries
1,1 times rated voltage	0,08	0,0012
1,0 times rated voltage	0,10	0,0015
0,75 times rated voltage	0,75	0,0060
0,55 times rated voltage	2,00	–

NOTE – For determining the internal resistance of a battery, two or more cells connected in parallel are considered to be one cell.