SLOVENSKI STANDARD
oSIST prEN 60335-2-76 {fragment 2}:2017

01-julij-2017

Nadomešča:
SIST EN 60335-2-76:2005
SIST EN 60335-2-76:2005/A1:2006
SIST EN 60335-2-76:2005/A11:2008
SIST EN 60335-2-76:2005/A12:2011
SIST EN 60335-2-76:2005/A2:2015

Gospodinjski in podobni električni aparati - Varnost - 2-76. del: Posebne zahteve za generatorje impulzov za električne ograje

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

Ta slovenski standard je istoveten z: **prEN 60335-2-76 {fragment 2}:2017**

ICS:

65.040.10	Poslopja, naprave in oprema za živino	Livestock buildings, installations and equipment

oSIST prEN 60335-2-76 {fragment 2}:2017 **en**

61H/347/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 60335-2-76/FRAG2 ED3**	
DATE OF CIRCULATION: **2017-05-26**	CLOSING DATE FOR VOTING: **2017-08-18**
SUPERSEDES DOCUMENTS: **61H/342/RR**	

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: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT 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.	

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Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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 2 of two fragments. It updates the standard to cover additional requirements for energizers connected to electric security fences and is based on the following documents:

61H/328/DC and 61H/335A/INF – see 61H/337/RM

Proposal:

3 Terms and definitions

3.126
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**

3.127
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

3.128
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**

3.129
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

3.130
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**

3.131
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

3.132
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**

3.133
type R security energizer
security energizer with one or two **fence circuits** that is suitable for use in a **type R security energizer group** restricted to a maximum output energy/impulse of 2,5 J per **fence circuit**

3.134
type R security energizer group
security energizer group where only the **type R security energizers** permitted in the instructions are allowed

3.135
type S security energizer
security energizer with one or two **fence circuits** that is suitable for use in a type S **security energizer group** not restricted to a maximum output energy/impulse of 2,5 J per **fence circuit**

3.136
type S security energizer group
security energizer group where **type S security energizers** and **type R security energizers** permitted in the instructions are allowed

7 Marking and instructions

7.1 *Addition:*

A **type R security energizer** shall be marked with symbol IEC60417 xxxx (2017-yy).

A **type S security energizer** shall be marked with symbol IEC60417 zzzz (2017-yy).

7.12.1 *Addition:*

A label signed by the authorized installer shall be attached to each **energizer** in a **security energizer group** indicating the authorized installer's contact details and the installation date.

A label signed by the authorized installer shall be attached to each **energizer** that is serviced in a **security energizer group** indicating the authorized installer's contact details and the service date.

7.6 *Addition:*

R	[symbol IEC60417 xxxx (2017-yy)]	time synchronized type R security energizer
S	[symbol IEC60417 zzzz (2017-yy)]	time synchronized type S security energizer

7.14 *Addition:*

The outer diameter of the circle of symbol symbol IEC60417 xxxx (2017-yy) and IEC60417 zzzz (2017-yy) shall be at least 15 mm.

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

– state that only type R security energizers or type S security energizers can be used in a security energizer group;

– specify that a type S security energizer shall not be used in a type R security energizer group;

– identify the model or type reference of security energizers that are permitted to be used in the security energizer group;

– state that security energizer groups shall only include security energizers that are identified in the instructions;

– specify the permitted configurations and connections of security energizers that may be used in the security energizer groups;

– 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;

– identify the model or type reference of the device producing the impulse timing signal source that is suitable for use in the security energizer group;

– provide an explanation of the hazards of not correctly configuring a security energizer when used in a security energizer group;

– explain the meaning of the time synchronized symbols IEC60417 xxxx (2017-yy) and IEC60417 zzzz (2017-yy);

– explain that an authorised installer is a person suitably trained 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;

– 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;

NOTE This should be based on the substance of definition 3.131.

– 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;

NOTE This should be based on the substance of definition 3.132.

– specify that a security energizer fence system must be configured and installed by, or under the responsibility of an authorized installer;

– specify that a security energizer fence system must be serviced and maintained by, or under the responsibility of an authorized installer.

The front section of the instructions shall include the substance of the following safety 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

11 Heating

11.5 *Replacement:*

Security energizers *used in a* ***security energizer group*** *shall be tested together in any permitted configuration and connection that may be allowed in the group.*

*The maximum and minimum supply voltage values are set in accordance with Table 102 using multiplier factors based on the **rated voltage** or **rated voltage range** of the appliance.*

Table 102 – rated supply voltage maximum and minimum value multiplier factors

Supply voltage value	*Mains*	*Battery (rechargeable)*	*Battery (non-rechargeable)*
minimum	*0,85*	*0,75*	*0,55*
maximum	*1,1*	*1,1*	*1,1*

*The **security energizer** feeding the first fence circuit is operated, for a given supply voltage type, on three supply voltage value settings in turn, the minimum value, the maximum value and one freely selected value between the minimum and maximum values, while the **security energizer** feeding the second fence circuit is supplied, for a given supply voltage type, with any supply voltage varied between the maximum and minimum values that is selected to produce the most unfavourable result.*

*The above tests are repeated, but with the first and second **security energizer** settings reversed. Refer to Table 103.*

Table 103 –supply voltage value test settings

Test	*First fence circuit supply*	*Second fence circuit supply*
1	*maximum value*	*selected for worst case*
2	*Minimum value*	*selected for worst case*
3	*freely selected value*	*selected for worst case*
4	*selected for worst case*	*maximum value*
5	*selected for worst case*	*minimum value*
6	*selected for worst case*	*freely selected value*

The above tests are repeated for both mains and battery supply voltage operation as applicable in accordance with Table 104.

Table 104 – Test supply sequence for different supply type

Test	*First fence circuit supply*	*Second fence circuit supply*
MM	*mains*	*mains*
MB	*mains*	*battery*
BM	*battery*	*mains*
BB	*battery*	*battery*

NOTE For a typical **security energizer group**, based on two **security energizers** that both can run on mains or rechargeable battery, there would be a total of twenty four tests performed; However in some cases where only mains or battery operation is indicated the number may be less or in the case where a non-rechargeable battery option is also included the number of tests could be doubled.

19 Abnormal operation

19.1 *Addition:*

***Security energizer groups** are also subjected to the tests of 19.106 and 19.107.*

19.13 *Addition:*

*For a **type R security energizer** during the tests the output characteristics of each **fence circuit** shall be as specified in 22.113 except for the pulse repetition rate. If the impulse repetition rate is greater than 1,34 Hz, the discharge energy per second into a load consisting of a non-inductive resistor of 500 Ω shall not exceed 1,25 J/s after 3 min.*

*For all other **energizers** during the tests the output characteristics of each **fence circuit** shall be as specified in 22.108 except for the pulse repetition rate. If the impulse repetition rate is greater than 1,34 Hz, the discharge energy per second into a load consisting of a non-inductive resistor of 500 Ω shall not exceed 2,5 J/s after 3 min.*

*For a **type R security Energizer group** during the tests the pulse synchronisation shall be as specified in 22.114. If the impulse repetition rate is greater than 1,34 Hz, the discharge energy per second into a replacement load consisting of a non-inductive resistor of 500 Ω shall not exceed 2,5 J/s after 3 min.*

*For a **type S security Energizer group** during the tests the combined **fence circuit** output characteristics measured in the 500 Ω resistor R_T shall be as specified in 22.115 for test configurations 5 and 6 except for the pulse repetition rate. If the impulse repetition rate is greater than 1,34 Hz, the discharge energy per second into the 500 Ω load R_T shall not exceed 2,5 J/s after 3 min.*

The temperature rises of the windings shall not exceed the values shown in Table 8.

19.106 Type S security energizer groups shall be tested to the requirements of clause 19 as an energizer supplied in one or more parts. As such, during the tests only a single fault shall be applied at a time in any one of the parts.

Compliance shall be checked for every permitted configuration and connection specified in the instructions.

19.107 ***Security energizer groups** are subjected to fault testing of the **impulse timing signal**. All possible **impulse timing signal** outputs are considered for faults occurring within the **impulse timing signal source** such as stopping, intermittent operation, low level, high level, variable rate, high rate etc. Whenever possible when an external **impulse timing signal source** is used, a fault shall be introduced such that the **impulse timing signal source** is no longer a viable method of synchronization. However if it can be shown that a particular fault condition is unlikely to occur then it should not be considered.*

22 Construction

22.111 The peak value of the output voltage, U_0, shall be measured and recorded to enable the tests and measurements of 14.102, 14.103, 14.104 and 16.3 to be carried out.

Compliance is checked by the following tests

*When the energizer is a **security energizer** marked as being permitted for use in a **security energizer group**, the peak value of the output voltage, U_0, should be the highest value of voltage measured when it is connected in a **security energizer group** and tested in any permitted configuration and connection of **security energizers** that may be used in the **security energizer group** given in the instructions. The group is supplied with the voltage in 11.5 under conditions of **normal operation**, but with a load connected to the output terminals of the **security energizer** or **security energizer group**, consisting of a capacitor having a capacitance that can be varied between 0 and 200 nF in steps of approximately 10 nF.*

*For all other energizers the peak value of the output voltage, U_0, is measured, using a arrangement described in 22.108 with the **energizer** supplied with the voltage in 11.5 under conditions of normal operation, but with a load connected to the output terminals consisting of a capacitor having a capacitance that can be varied between 0 and 200 nF in steps of approximately 10 nF.*

NOTE **Type R energizers** that are permitted only for use in a **type R security energizer group** where all the **type R energizers** are exactly the same model are excluded from the **security energizer group** tests of this clause.

22.113 In addition to the output characteristics of each **fence circuit** of a **type R security energizer** being as specified in 22.108, the energy per impulse delivered by each **fence circuit** into the **standard load** shall not exceed 2,5 J.

NOTE The energy per impulse is the total integrated impulse energy during the maximum pulse duration of 10ms. When measuring the energy per impulse into the standard load, the variable resistor should be adjusted to maximize the energy into the **standard load** and not to maximise the energy in the 500 Ω component of the **standard load** as is usual.

22.114 Type R security energizer group output characteristics measured in the 500 Ω component of the standard load shall be such that

– the impulse repetition rate shall not exceed 1 Hz;

– the **impulse duration** of the impulse shall not exceed 10 ms.

*Compliance is checked by measurement when the **type R security energizer group** is supplied with the voltage in 11.5, being operated under conditions of **normal operation** but with the **standard load** connected to the output terminals as shown in Figure 103 Test configuration A and the test repeated with the **standard load** connected to the output terminals as shown in Figure 103 Test configuration B.*

The measurements are made using a measuring arrangement with an input impedance consisting of a non-inductive resistance of not less than 1 MΩ in parallel with a capacitance of not more than 100 pF.

22.115 Type S security energizer group output characteristics measured in the 500 Ω resistor RT shall be such that

– the impulse repetition rate shall not exceed 1 Hz;

– the **impulse duration** of the impulse shall not exceed 10 ms;

– for **energy limited energizers** the energy/impulse shall not exceed 5 J;

NOTE The energy/impulse is the energy measured in the impulse over the **impulse duration**.

– for **current limited energizers** the **output current** shall not exceed for

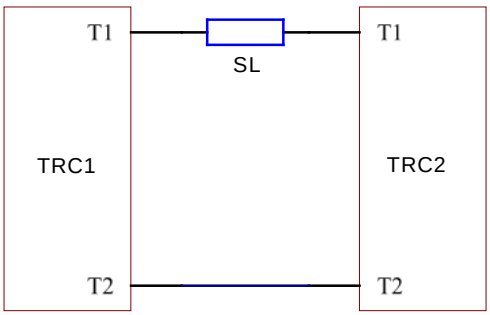
  - an **impulse duration** of greater than 0,1 ms, the value specified by the characteristic limit line detailed in Figure 102;

  - an **impulse duration** of not greater than 0,1 ms, 15 700 mA.

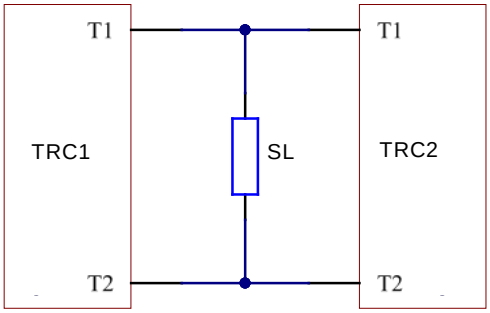
*Compliance is checked by measurement when the **type S security energizer group** is supplied with the voltage in 11.5, being operated under conditions of **normal operation** but with the six test load configurations shown in Figure 104 connected to the output terminals and tested each in turn.*

To obtain the most unfavourable results the 500 Ω resistor R_T shall also be removed from the circuit while variable resistors R_A and R_B are adjusted and then re-introduced when the measurements are taken.

The measurements are made using a measuring arrangement with an input impedance consisting of a non-inductive resistance of not less than 1 MΩ in parallel with a capacitance of not more than 100 pF.



Test configuration A



Test configuration B

Key

TRC1	=	Type R fence circuit 1
TRC2	=	Type R fence circuit 2
SL	=	Standard load
T1, T2	=	**Type R security energizer group** output terminals

Figure 103 - Type R security energizer group test configurations