



**SLOVENSKI STANDARD**  
**SIST EN 50636-2-107:2015**  
**01-september-2015**

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**Varnost gospodinjskih in podobnih električnih aparatov - 2-107. del: Posebne zahteve za baterijske robotsko vodene električne vrtno kosilnice**

Safety of household and similar appliances - Part 2-107: Particular requirements for robotic battery powered electrical lawnmowers

Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke - Teil 2-107: Besondere Anforderungen für batteriebetriebene Roboter-Rasenmäher

Appareils électrodomestiques et analogues - Partie 2-107: Exigences particulières relatives aux tondeuses à gazon électriques robotisées alimentées par batteries

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EUROPEAN STANDARD

**EN 50636-2-107**

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ICS 65.060.70

English Version

**Safety of household and similar appliances - Part 2-107:  
Particular requirements for robotic battery powered electrical  
lawnmowers  
(IEC 60335-2-107:2012 , modified)**

This European Standard was approved by CENELEC on 2014-12-01. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

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## Foreword

This document (EN 50636-2-107:2015) has been prepared by CLC/TC 116, "Safety of hand-held motor-operated electric tools".

The following dates are fixed:

- latest date by which the standard has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2015-12-01
- latest date by which the national standards conflicting with the standard have to be withdrawn (dow) 2017-12-01

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.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directives.

For the relationship with EU Directive 2006/42/EC, see informative Annex ZZ, which is an integral part of this document.

The text of IEC 60335-2-107:2012 has been revised by CLC/TC 116/WG 5, "Garden appliances", to bring this European Standard in line with the European Machinery Directive 2006/42/EC.

This document was submitted to the UAP under the reference FprEN 60335-2-107:2013. CLC/TC 116 confirmed that EN 60335-1:2012 is Part 1 of this document.

This European Standard is to be used in conjunction with EN 60335-1:2012, "*Household and similar electrical appliances - Safety - Part 1: General requirements*" and its amendments.

When "Part 1" is mentioned in this standard, it refers to EN 60335-1:2012.

This European Standard supplements or modifies the corresponding clauses in Part 1, so as to convert that publication into the European Standard "*Particular requirements for robotic battery powered electrical lawnmowers*".

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

Compliance with the relevant clauses of Part 1 together with this European Standard provides one means of conforming to the specified essential health and safety requirements of the Directive concerned.

This European Standard follows the overall requirements of EN ISO 12100:2010.

**Warning:** Other requirements arising from other EU Directives can be applicable to the products falling within the scope of this European Standard.

The following numbering system is used:

- subclauses that are numbered starting from 101 are additional to those in Part 1;
- additional annexes are lettered AA, BB, etc.

NOTE In this European Standard the following print types are used:

- requirements proper: in Roman type;

- *test specifications: in italic type;*
- explanatory matter: in smaller Roman type.

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

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## Introduction

This document is a type C standard as stated in EN ISO 12100:2010.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered is as indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the other standards, for machines which have been built and designed to the provisions of this type C standard.

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## 1 Scope

This clause of Part 1 is replaced by the following:

This European Standard specifies safety requirements and their verification for the design and construction of **robotic** battery powered electrical **rotary lawnmowers** and their **peripherals** with the **rated voltage** of the battery being not more than 75 V d.c. charged by mains electrical and/or alternative energies, e.g. solar power.

This European Standard does not apply to non-robotic machines such as **lawn trimmers, lawn edge trimmers, lawn edgers, ride-on lawnmowers** or **pedestrian controlled lawnmowers**.

This European Standard is not applicable to EMC and environmental hazards (except noise).

This European Standard does not apply to internal combustion engine(s), hybrid and fuel cell powered machines and associated charging systems.

This European Standard deals with all the significant hazards presented by battery powered **robotic lawnmowers** and their **peripherals** when they are used as intended and under conditions of misuse which are reasonably foreseeable.

This European Standard is not applicable to machines, which are manufactured before the date of publication of this document by CENELEC.

NOTE This European Standard does not apply to battery chargers (EN 60335-2-29:2004).

## 2 Normative references

This clause of Part 1 is applicable except as follows.

### Addition:

EN 60320-1:2001+ EN 60320-1-2001/A1:2007, *Appliance couplers for household and similar general purposes – Part 1: General requirements (IEC 60320-1:2001 + A1:2007)*

EN 60320-2-1:2000, *Appliance couplers for household and similar general purposes – Part 2-1: Sewing machine couplers (IEC 60320-2-1:2000)*

EN 60320-2-2:1998, *Appliance couplers for household and similar general purposes – Part 2-2: Interconnection couplers for household and similar equipment (IEC 60320-2-2:1998)*

EN 60320-2-4:2006 + EN 60320-2-4:2006/A1:2009, *Appliance couplers for household and similar general purposes – Part 2 -4: Appliance couplers dependent on appliance weight for engagement (IEC 60320-2-4:2005 + A1:2009)*

EN 60335-1:2012, *Household and similar electrical appliances – Safety – Part 1: General requirements (IEC 60335-1:2010, mod.)*

EN 60335-2-29:2004, *Household and similar electrical appliances – Safety – Part 2-29: Particular requirements for battery chargers (IEC 60335-2-29:2002)*

EN 61032:1998, *Protection of persons and equipment by enclosures – Probes for verification (IEC 61032:1997)*

EN 62133:2003, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications (IEC 62133:2002)*

EN ISO 354:2003, *Acoustics – Measurement of sound absorption in a reverberation room (ISO 354:2003)*

EN ISO 3744:2010, *Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 4871:2009, *Acoustics – Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 7010:2012, *Graphical symbols – Safety colours and safety signs – Registered safety signs (ISO 7010:2011)*

EN ISO 11201:2010, *Acoustics – Noise emitted by machinery and equipment – Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN ISO 11203:2009, *Acoustics – Noise emitted by machinery and equipment – Determination of emission sound pressure levels at a work station and at other specified positions from the sound power level (ISO 11203:1995)*

EN ISO 11688-1:2009, *Acoustics – Recommended practice for the design of low-noise machinery and equipment – Part 1: Planning (ISO/TR 11688-1:1995)*

EN ISO 12100:2010, *Safety of machinery – General principles for design – Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13857:2008, *Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

ISO 683-4:2014, *Heat-treatable steels, alloy steels and free-cutting steels – Part 4: Free-cutting steels*

ISO 3767-1:1998+A1:2008+A2:2012, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays – Part 1: Common symbols*

ISO 3767-3:1995, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays – Part 3: Symbols for powered lawn and garden equipment*

ISO 7000:2014, *Graphical symbols for use on equipment – Index and synopsis*

ISO 11684:1995, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment – Safety signs and hazard pictorials – General principles*

### 3 Definitions

This clause of Part 1 is applicable except as follows.

#### 3.101 Void

#### 3.102 control

means or device which will control the operation of the machine or any specific operating function thereof

#### 3.103 cutting means

mechanism used to provide the cutting action

Note 1 to entry The term "blade" can be used in warnings and instructions to denote "**cutting means**".

#### 3.104 cutting means enclosure

part or assembly which provides the protective means around the **cutting means**

#### 3.105 cutting means tip circle

path described by the outermost point of the **cutting means** as it rotates about its shaft axis

#### 3.106 cutting position

any height setting of the **cutting means** designated by the manufacturer for cutting grass

#### 3.107 disabling device

##### a) removable

detachable part, such as for example a key, which prevents operation of the **lawnmower** when it is removed

##### b) code protected

device which, when operated, prevents operation of the **lawnmower** and requires a coded input (such as via a keypad) before it can operate

Note 1 to entry: See Clause 22.103.

#### 3.108 discharge chute

extension of the **cutting means enclosure** from the **discharge opening**, generally used to control the discharge of material from the **cutting means**

#### 3.109 discharge opening

gap or opening in the **cutting means enclosure** through which grass can be discharged

#### 3.110 charging station

automatic battery charging facility located on or within the delimited or pre-programmed area

#### 3.111 manual stop

device using software-based or hardware-based components that overrides all other **controls** and removes power to the motor(s) and brings all moving parts to a stop

#### 3.112 grass catcher

part or combination of parts which provides a means for collecting grass clippings or debris

**3.113****guard**

part of the machine or a component incorporated to provide protection for the operator and/or bystander by means of a physical barrier

**3.114****intended use**

any use of the machine which is reasonably foreseeable, as described in the instruction manual, and which is consistent with such activities as cutting grass, starting, stopping, or connecting to (or disconnecting from) a source of power

**3.115****lawn edge trimmer**

powered grass cutting machine for trimming lawn edges usually in a vertical plane

**3.116****lawn edger**

powered machine suitable for cutting lawn and soil, usually in a vertical plane

**3.117****lawnmower**

grass-cutting machine where the **cutting means** operates in a plane approximately parallel to the ground and which uses the ground to determine the height of cut by means of wheels, air cushion or skids, etc., and which utilizes an electric motor for a **power source**

**3.118****lawn trimmer**

powered grass-cutting machine where the operator determines the plane of operation of the **cutting means** and the height of cut, possibly assisted by a wheel or skid, etc.

**3.119****manual controller**

device either connected by a wire or wireless that allows manual control of the movement and **cutting means** operation of the machine

**3.120****maximum operating motor speed**

the highest motor speed obtainable when adjusted in accordance with the manufacturers specifications and/or instructions, with the **cutting means** engaged

**3.121****mowing attachment**

**cutting means** designed to be easily detached from the machine, generally to allow the machine to be used for other purposes

**3.122****mulching lawnmower**

rotary lawnmower without **discharge openings** in the **cutting means enclosure**

**3.123****no load**

the minimum load attainable at **rated voltage**

**3.124****operator control**

any **control** requiring operator actuation to perform specific functions

Note 1 to entry: This includes **controls** on a **manual controller**.

**3.125****operator presence control**

**control** on a **manual controller** designed so that it will automatically interrupt power to a drive when the operator's actuating force is removed

**3.126****pedestrian controlled lawnmower**

grass-cutting machine, either pushed or self-propelled, normally controlled by the operator holding a handle walking behind the unit

**3.127****perimeter delimiter**

a device(s) that define the perimeter of the area within which the machine can operate automatically

**3.128****power source**

motor which provides mechanical energy for linear or rotational movement

**3.129****ride-on lawnmower**

self-propelled **lawnmower** on which an operator rides and which is designed primarily for cutting grass

**3.130****robotic lawnmower**

unattended **lawnmower** that operates automatically

Note 1 to entry: When the term 'machine' is used in the text of this standard, it is used to denote a **robotic lawnmower**.

**3.131****rotary lawnmower**

**lawnmower** in which the **cutting means**, cutting by impact, rotate about an axis (axes) normal to the cutting plane

**3.132****sensor**

device that responds to physical stimuli (such as, but not limited to, heat, light, sound, pressure, magnetism, motion) and transmits the resulting signal or data providing a measurement, operating a **control**, or both:

**a) lift sensor**

device that senses when the machine is lifted bodily from the ground

**b) obstruction sensor**

device that senses when the machine contacts an obstruction

**c) tilt sensor**

device that senses when the machine is at or above a predetermined angle of incline

**d) rollover sensor**

device that senses when the machine is inverted

**3.133****stopping time**

the time elapsed between the instant when either a **sensor** is activated or the actuator on a **manual controller** is released and the instant at which the machine or component comes to a stop

**3.134****thrown object hazard**

the potential for injury caused by object(s) propelled by the moving **cutting means**

**3.135****traction drive**

the means (system) used to transmit power from the **power source** to the ground drives means

**3.136****remote setting device**

a setting device which is not connected by wire to the **lawnmower** and designed to set the basic functions of the **lawnmower** but not for controlling the **lawnmower**

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**3.137****working area**

any defined area in which the machine can function automatically

**3.138****peripherals**

equipment additional to the machine itself that is provided by the manufacturer for intended use of the machine, e.g. charging station(s), manual controller

**4 General requirement**

This clause of Part 1 is applicable except as follows:

**4.101 Attachments**

Where attachments are available from the original manufacturer which modify the use of a **robotic lawnmower**, the complete machine shall still comply with the safety requirements of this standard.

*Compliance is checked by inspection and by the relevant tests, where applicable.*

**5 General conditions for the tests**

This clause of Part 1 is applicable except as follows:

**5.1 Addition:**

Where an electronic speed **control** device can be adjusted, it is set for the highest speed.

**5.2 Replacement:**

A new machine shall be used for each of the tests of Clause 21.

**5.8.1 Replacement:**

Unless otherwise specified, a fully charged battery shall be used for each test. Where for consecutive tests the same battery is specified, there shall be a minimum of 1 min rest time between tests.

**6 Classification**

This clause of Part 1 is applicable except as follows:

**6.1 Replacement:**

Machines shall be of one of the following classes with respect to protection against electric shock:

- machines and charging **stations** with a rated voltage above 42 V shall be **class II**;  
parts of machines with an integrated mains powered charger shall be **class II**; other parts complying with **SELV** shall be at least **class III**;
- **charging stations** supplied with **SELV** shall be at least **class III**;
- other machines shall be at least **class III**.

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

**6.2 Addition:**

**Class II** parts of machines shall be at least IPX4.

**Class III** machines shall be at least IPX1.

**7 Marking and instructions**

This clause of Part 1 is applicable except as follows:

**7.1 Replacement:**

Replace the third indent by:

- rated power in kilowatts or rated current in amperes for mains supplied chargers

**7.1 Addition:**

Add the following indents:

- business name and full address of the manufacturer and, where applicable, his authorized representative;
- year of construction;
- mass in kilograms;
- designation of the machine,  
designation of machine may be achieved by a combination of letters and/or numbers provided that this code is explained by giving the explicit designation such as “battery powered **robotic lawnmowers**” etc. in the instructions supplied with the machine;

NOTE 1 An example of such code is “A123B”.

- designation of series or type,  
allowing the technical identification of the product. This may be achieved by a combination of letters and/or numbers and may be combined with the designation of machine;

NOTE 2 The term “designation of series or type” is also known as model number.

- serial number, if any;
- mandatory markings;

NOTE 3 For machines and their related products intended to be put on the market in the EEA, CE-marking as defined in the applicable European Directive(s), e.g. the Machinery Directive.

- symbol IEC 60417-5172 for class II machines only;
- symbol IEC 60417-5180 (2003-02), for class III machines. This marking is not necessary for machines that are operated only by batteries (primary batteries or secondary batteries that are recharged outside of the machine);
- cutting width in centimetres.

**Controls** which may give rise to a hazard (e.g. operator presence controls in accordance with Clause 20.101.1) when operated shall be marked or so placed as to indicate clearly which part of the machine they control.

The following warnings shall be located in easily visible positions, indicating:

On the machine:

WARNING – Read instruction manual before operating the machine.

WARNING – Keep a safe distance from the machine when operating.

WARNING – Do not ride on the machine.

WARNING – Remove (or operate) the **disabling device** before working on or lifting the machine.

NOTE 4 Use “Remove” or “Operate” as appropriate to the type of **disabling device** that is fitted to the machine.

CAUTION – Do not touch rotating blade.