# Kolbsisepõlemismootori käitatavad generaatoragregaadid. Ohutus

Reciprocating internal combustion engine driven generating sets - Safety

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

| | |
|---|---|
| Käesolev Eesti standard EVS-EN 12601:2010 sisaldab Euroopa standardi EN 12601:2010 ingliskeelset teksti. | This Estonian standard EVS-EN 12601:2010 consists of the English text of the European standard EN 12601:2010. |
| Standard on kinnitatud Eesti Standardikeskuse 31.12.2010 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas. | This standard is ratified with the order of Estonian Centre for Standardisation dated 31.12.2010 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation. |
| Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 01.12.2010. | Date of Availability of the European standard text 01.12.2010. |
| Standard on kättesaadav Eesti standardiorganisatsioonist. | The standard is available from Estonian standardisation organisation. |



**ICS** 27.020, 29.160.40

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 12601

December 2010

ICS 27.020; 29.160.40

Supersedes EN 12601:2001

English Version

# Reciprocating internal combustion engine driven generating sets - Safety

Groupes électrogènes entraînés par moteurs alternatifs à combustion interne - Sécurité

Stromerzeugungsaggregate mit Hubkolben-Verbrennungsmotoren - Sicherheit

This European Standard was approved by CEN on 23 October 2010.

CEN 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 CEN 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 CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: Avenue Marnix 17, B-1000 Brussels**



Ref. No. EN 12601:2010: E

# Contents

Page

## Foreword

This document (EN 12601:2010) has been prepared by Technical Committee CEN/TC 270 “Internal Combustion Engines”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2011 and conflicting national standards shall be withdrawn at the latest by June 2011.

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

This document supersedes EN 12601:2001.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA , which is an integral part of this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

# Introduction

This document is a type C standard as stated in EN ISO 12100 (all parts).

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered are 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 provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

## 1 Scope

This European Standard specifies the safety requirements for reciprocating internal combustion (RIC) engine driven generating sets up to 1 000 V consisting of a RIC engine, an alternating current (a.c.) generator including the additional equipment required for operating, e.g. controlgear, switchgear, auxiliary equipment.

This European Standard is not applicable for generating sets which are manufactured before the date of its publication as a national EN standard.

It applies to generating sets for land and marine use, excluding generating sets used on board of seagoing vessels and mobile offshore units as well as on aircraft or to propel road vehicles and locomotives. The special requirements needed to cover operation in potentially explosive atmospheres are not covered in this standard.

The hazards relevant to RIC engine driven generating sets are identified in Annex A.

## 2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 547-2, *Safety of machinery — Human body measurements — Part 2: Principles for determining the dimensions required for access openings*

EN 953, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN 981, *Safety of machinery — System of auditory and visual danger and information signals*

EN 1679-1:1998, *Reciprocating internal combustion engines — Safety — Part 1: Compression ignition engines*

EN 60034-5:2001, *Rotating electrical machines — Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) — Classification (IEC 60034-5:2000)*

EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)*

EN 60335-1:2002, *Household and similar electrical appliances — Safety — Part 1: General requirements (IEC 60335-1:2001, modified)*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)*

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

EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)*

EN ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1:2006)*

EN ISO 13850:2008, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)*

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

EN ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways (ISO 14122-2:2001)*

ISO 2261:1994, *Reciprocating internal combustion engines — Hand-operated control devices — Standard direction of motion*

ISO 2710-1:2000, *Reciprocating internal combustion engines — Vocabulary — Part 1: Terms for engine design and operation*

ISO 2710-2:1999, *Reciprocating internal combustion engines — Vocabulary — Part 2: Terms for engine maintenance*

ISO 3046-1:2002, *Reciprocating internal combustion engines — Performance — Part 1: Declarations of power, fuel and lubricating oil consumptions, and test methods — Additional requirements for engines for general use*

ISO 3046-6:1990*, Reciprocating internal combustion engines — Performance — Part 6: Overspeed protection*

ISO 6826:1997, *Reciprocating internal combustion engines — Fire protection*

ISO 7000, *Graphical symbols for use on equipment — Index and synopsis*

ISO 7967-1:2005, *Reciprocating internal combustion engines — Vocabulary of components and systems — Part 1: Structure and external covers*

ISO 7967-2:1987, *Reciprocating internal combustion engines — Vocabulary of components and systems — Part 2: Main running gear*

ISO 7967-3:2010, *Reciprocating internal combustion engines — Vocabulary of components and systems — Part 3: Valves, camshaft drive and actuating mechanisms*

ISO 7967-4:2005, *Reciprocating internal combustion engines — Vocabulary of components and systems — Part 4: Pressure charging and air/exhaust gas ducting systems*

ISO 7967-8:2005, *Reciprocating internal combustion engines — Vocabulary of components and systems — Part 8: Starting systems*

ISO 7967-9:2010, *Reciprocating internal combustion engines — Vocabulary of components and systems — Part 9: Control and monitoring systems*

ISO 8528-1:2005, *Reciprocating internal combustion engine driven alternating current generating sets — Part 1: Application, ratings and performance*

ISO 8528-2:2005, *Reciprocating internal combustion engine driven alternating current generating sets — Part 2: Engines*

ISO 8528-3:2005, *Reciprocating internal combustion engine driven alternating current generating sets — Part 3: Alternating current generators for generating sets*

ISO 8528-4:2005, *Reciprocating internal combustion engine driven alternating current generating sets — Part 4: Controlgear and switchgear*

ISO 8528-5:2005, *Reciprocating internal combustion engine driven alternating current generating sets — Part 5: Generating sets*

ISO 8528-6:2005, *Reciprocating internal combustion engine driven alternating current generating sets — Part 6: Test methods*

ISO 8528-7:1994, *Reciprocating internal combustion engine driven alternating current generating sets — Part 7: Technical declarations for specification and design*

ISO 8528-8:1995, *Reciprocating internal combustion engine driven alternating current generating sets — Part 8: Requirements and tests for low-power generating sets*

ISO 8528-9:1995, *Reciprocating internal combustion engine driven alternating current generating sets — Part 9: Measurement and evaluation of mechanical vibrations*

ISO 8528-10:1998, *Reciprocating internal combustion engine driven alternating current generating sets — Part 10: Measurement of airborne noise by the enveloping surface method*

IEC 60364-4-41:2005, *Low-voltage electrical installations — Part 4-41: Protection for safety — Protection against electric shock*

IEC 60417-DB-12M:2002, *Graphical symbols for use on equipment — 12-month subscription to online database comprising all graphical symbols published in IEC 60417*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8528-1:2005, ISO 8528-2:2005, ISO 8528-3:2005, ISO 8528-4:2005, ISO 8528-5:2005, ISO 8528-6:2005, ISO 8528-7:1994, ISO 8528-8:1995, ISO 8528-9:1995, ISO 8528-10:1998, ISO 2710-1:2000, ISO 2710-2:1999, ISO 3046-1:2002, ISO 3046-6:1990, ISO 7967-1:2005, ISO 7967-2:1987, ISO 7967-3:2010, ISO 7967-4:2005, ISO 7967-8:2005, ISO 7967-9:2010, and EN ISO 12100-1:2003 and the following apply.

**3.1**
**low power generating sets**
power generating sets for the purpose of this standard which are determined by the following special features:

- low power is taken to mean power of a magnitude up to approximately 10 kW;
- users normally are laymen;
- complete generating set is usually transportable, or mobile;
- electrical output is connected by plugs and sockets;
- generating set is ready for use without any additional installation work by the user

**3.2**
**close proximity**
30-mm space immediately around the operating and adjusting controls and carrying handles, including their whole movement range

## 4 General

If the installation of a generating set can create hazards in addition to those covered by this European Standard, the safety requirements and/or protective measures related to these additional hazards are the responsibility of the installer, if necessary with the agreement of the manufacturer of the generating set. The