INTERNATIONAL STANDARD

IEC 88528-11

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Reciprocating internal combustion engine driven alternating current generating sets –

Part 11:
Rotary uninterruptible power systems –
Performance requirements and test methods

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

RECIPROCATING INTERNAL COMBUSTION ENGINE DRIVEN ALTERNATING CURRENT GENERATING SETS –

Part 11: Rotary uninterruptible power systems – Performance requirements and test methods

FOREWORD

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International Standard IEC 88528-11 has been prepared jointly by IEC technical committee 2: Rotating machinery, and ISO technical committee 70: Internal combustion engines.

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

FDIS	Report on voting
2/1275/FDIS	2/1280/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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

IEC 88528-11 is integrated into the ISO 8528 series listed below, under the general title *Reciprocating internal combustion engine driven alternating current generating sets:*

Part 1: Application, ratings and performance

Part 2: Engines

Part 3: Alternating current generators for generating sets

Part 4: Controlgear and switchgear

Part 5: Generating sets

Part 6: Test methods

Part 7: Technical declarations for specification and design

Part 8: Requirements and tests for low-power generating sets (available in English only)

Part 9: Measurement and evaluation of mechanical vibrations (available in English only)

Part 10: Measurement of airborne noise by the enveloping surface method

Part 12: Emergency power supply to safety services

RECIPROCATING INTERNAL COMBUSTION ENGINE DRIVEN ALTERNATING CURRENT GENERATING SETS –

Part 11: Rotary uninterruptible power systems – Performance requirements and test methods

1 Scope

This International Standard, which forms part of the ISO 8528 series, specifies criteria, including performance and test methods, for rotary uninterruptible power systems (UPS) arising out of a combination of mechanical and electrical rotating machines. This standard applies to power supplies primarily designed for supplying uninterrupted a.c. power to the consumer. When operated without input mains feed, the power is provided by stored energy and/or reciprocating internal combustion (RIC) engine and the output power is provided by one or more rotating electrical machines.

This part 11 applies to a.c. power supplies primarily designed for supplying uninterruptible electrical power for stationary land and marine use, excluding supplies for aircraft, land vehicles or locomotives. It also excludes power supplies where the output power is generated by static converters. (See IEC 62040-3.)

The use of a rotary UPS installation to improve the quality of a.c. power supply, to provide voltage and/or frequency conversion, and to provide peak shaving is also described.

For some specific applications (for example, essential hospital supplies, offshore, non-stationary applications, high rise buildings, nuclear, etc.) supplementary requirements may be necessary. The provisions of this part of ISO 8528 should be used as a basis.

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.

IEC 60034-1:2003, *Rotating Electrical Machines – Part 1: Rating and performance*

IEC 60034-22:1996, *Rotating Electrical Machines – Part 22: AC generators for reciprocating internal combustion (RIC) engine driven generating sets*

IEC 60417 (all parts), *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets*

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

IEC 61000, *Electromagnetic compatibility (EMC)*

ISO 3046-1:2003, *Reciprocating internal combustion engines*

ISO 7000, *Graphical symbols for use on equipment*

ISO 8178-1, *Reciprocating internal combustion engines – Exhaust emission measurement – Part 1: Test-bed measurement of gaseous and particulate exhaust emissions*

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

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

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

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 General

3.1.1
generating set
one or more RIC engines to produce mechanical energy and one or more generators to convert the mechanical energy into electrical energy together with components for transmitting the mechanical energy (for example, couplings, gearbox) and where applicable bearing and mounting components

3.1.2
uninterruptible power system (UPS)
power system for maintaining continuity of load power in the event of failure of the mains power

3.1.3
rotary UPS
UPS where one or more electrical rotating machines provide the output voltage

3.1.4
converter
set of equipment, static or rotating, to convert one type of electric current to another type, different in nature, voltage and/or frequency

3.1.5
power system reactor
regulated or non-regulated inductance in series with the input of some types of UPS

3.1.6
machine set
any combination of one or more electrical rotating machines

3.1.7
energy storage device
device to provide stored energy on failure of the normal power supply system. This energy shall be available either during the total failure time or until the take over of a power supply by the RIC engine

3.1.8
continuity of load power
availability of the power supplied to the load with voltage and frequency within steady-state and transient tolerance bands and with distortion and power interruptions within the limits specified for the load