



TECHNICAL SPECIFICATION



**Marine energy – Wave, tidal and other water current converters –
Part 100: Electricity producing wave energy converters – Power performance
assessment**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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MARINE ENERGY – WAVE, TIDAL AND OTHER WATER CURRENT CONVERTERS –

Part 100: Electricity producing wave energy converters – Power performance assessment

FOREWORD

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The main task of IEC technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a Technical Specification when

- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical Specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62600-100, which is a technical specification, has been prepared by IEC technical committee 114: Marine energy – Wave, tidal and other water current converters.

The text of this technical specification is based on the following documents:

| | |
|---------------|------------------|
| Enquiry draft | Report on voting |
| 114/87/DTS | 114/95/RVC |

Full information on the voting for the approval of this technical specification 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.

A list of all parts in the IEC 62600 series, published under the general title *Marine Energy – Wave, tidal and other water current converters*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

The contents of the corrigendum of April 2017 have been included in this copy.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 62600, which is a Technical Specification, provides performance assessment methods for Wave Energy Conversion Systems (WECS). A Wave Energy Converter (WEC) is a device which generates electricity using the action of water waves and delivers electricity to an electrical load.

Wave energy industry development is transitioning from preliminary stages to commercial production stages. Validated data gathering and processing techniques are important to improve existing technologies. This technical specification will be subject to changes as data are collected and processed from testing of WECS.

The expected users of the specification include:

- device developers who want to validate the performance of their WEC;
- investors who want to assess the performance of a device developer's WEC;
- project developers who want to assess the performance of their project against manufacturer's claims;
- surveyors contracted to carry out the assessment.

MARINE ENERGY – WAVE, TIDAL AND OTHER WATER CURRENT CONVERTERS –

Part 100: Electricity producing wave energy converters – Power performance assessment

1 Scope

This part of IEC 62600, which is a Technical Specification, provides a method for assessing the electrical power production performance of a Wave Energy Converter (WEC), based on the performance at a testing site.

The scope of this Technical Specification includes:

- a) all WECs that produce electrical power from wave energy;
- b) all sea resource zones (near and offshore, deep and shallow water);
- c) the specification applies to commercial scale WECs that are:
 - 1) compliantly moored,
 - 2) tautly moored,
 - 3) bottom mounted,
 - 4) shore mounted.

The scope of this Technical Specification does not include:

- a) WECs that produce other forms of energy unless this energy is converted into electrical energy;
- b) resource assessment;
- c) scaled devices in test facilities (tank or scaled sea conditions) where any scaling would need to be carried out to extrapolate results for a full scale device;
- d) power quality issues;
- e) environmental issues;
- f) power matrix transposition from one location to another.

This Technical Specification provides a systematic method which includes:

- measurement of WEC power output in a range of sea states;
- WEC power matrix development;
- an agreed framework for reporting the results of power and wave measurements.

2 Normative references

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

IEC 60044-1, *Instrument transformers – Part 1: Current transformers*

IEC 60688, *Electrical measuring transducers for converting a.c. electrical quantities to analogue or digital signals*

IEC 61000-3 (all parts), *Electromagnetic compatibility (EMC) – Part 3: Limits*

IEC 61869-3, *Instrument transformers – Part 3: Additional requirements for inductive voltage transformers*

ISO/IEC Guide 98-1:2009, *Uncertainty of measurement – Part 1: Introduction to the expression of uncertainty in measurement*

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

ISO 8601, *Data elements and interchange formats – Information interchange – Representation of dates and times*

EquiMar: Protocols for the equitable assessment of marine energy converters, Part II, Chapters I.A.1 through I.A.5., Editors: David Ingram, George Smith, Claudio Bittencourt Ferreira, Helen Smith. European Commission 7th framework programme grant agreement number 213380, First Edition 2011

NDBC:2009, Technical Document 09-02, *Handbook of automated data quality control checks and procedures.* National Data Buoy Center, August 2009