



TECHNICAL SPECIFICATION



Marine energy – Wave, tidal and other water current converters – Part 40: Acoustic characterization of marine energy converters

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 27.140

ISBN 978-2-8322-6926-8

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARINE ENERGY – WAVE, TIDAL AND
OTHER WATER CURRENT CONVERTERS –****Part 40: Acoustic characterization of marine energy converters**

FOREWORD

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- 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 TS 62600-40, 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 Specifications based on the following documents:

Draft TS	Report on voting
114/297/DTS	114/307/RVDTS

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 document 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.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

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- withdrawn,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

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

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INTRODUCTION

The purpose of this document is to provide uniform methodologies that will ensure consistency and accuracy in the measurement and analysis of acoustical emissions from marine energy converters. These systems include wave, current (tidal, ocean, and river), and ocean thermal energy conversion. The document provides guidance on the measurement, analysis, and reporting of acoustic emissions from marine energy converters and has been prepared with the anticipation that it would be applied by:

- Marine energy converter manufacturers striving to meet well-defined acoustic emission performance requirements and/or a possible declaration system;
- Purchasers of marine energy converters to specify such performance requirements;
- Operators of marine energy converters who may be required to verify that stated, or required, acoustic performance specifications are met for new or refurbished units;
- Operators of marine energy test sites, who may be required to assess conformity with consented acoustic levels at their sites;
- Marine energy converter planners or regulators who must be able to accurately and fairly define acoustical emission characteristics of marine energy converters in response to environmental regulations or permit requirements for new or modified installations.

The methods and reporting requirements in this document ensure that continuing development and operation of marine energy converters is carried out in an atmosphere of consistent and accurate communication relative to environmental concerns.

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

Part 40: Acoustic characterization of marine energy converters

1 Scope

This part of IEC 62600 provides uniform methodologies to consistently characterize the sound produced by the operation of marine energy converters that generate electricity, including wave, current, and ocean thermal energy conversion. This document does not include the characterization of sound associated with installation, maintenance, or decommissioning of these converters, nor does it establish thresholds for determining environmental impacts. Characterization refers to received levels of sound at particular ranges, depths, and orientations to a marine energy converter. Informative Annex B provides guidance on additional measurements that would be necessary to estimate source levels.

The scope of this document encompasses methods and instrumentation to characterize sound near marine energy converters, as well as the presentation of this information for use by regulatory agencies, industry, and researchers. Guidance is given for instrumentation calibration, deployment methods around specific types of marine energy converters, analysis procedures, and reporting requirements.

This document is applicable to characterization of sound from individual converters and arrays. This document primarily describes measurement procedures for individual converters, with extension to arrays discussed in informative Annex A.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60565, *Underwater acoustics – Hydrophones – Calibration in the frequency range 0,01 Hz to 1 MHz*

IEC 61108-4, *Maritime navigation and radiocommunication equipment and systems – Global navigation satellite systems (GNSS) – Part 4: Shipborne DGPS and DGLONASS maritime radio beacon receiver equipment – Performance requirements, methods of testing and required test results*

IEC 61400-12-1, *Wind energy generation systems – Part 12-1: Power performance measurements of electricity producing wind turbines*

IEC TS 62600-1, *Marine energy – Wave, tidal and other water current converters – Part 1: Terminology*

IEC TS 62600-20, *Marine energy – Wave, tidal and other water current converters – Part 20: Design and analysis of an Ocean Thermal Energy Conversion (OTEC) plant – General guidance*

IEC TS 62600-100, *Marine energy – Wave, tidal and other water current converters – Part 100: Electricity producing wave energy converters – Power performance assessment*

IEC TS 62600-200, *Marine energy – Wave, tidal and other water current converters – Part 200: Electricity producing tidal energy converters – Power performance assessment*

ISO 17208-1, *Underwater acoustics – Quantities and procedures for description and measurement of underwater sound from ships – Part 1: Requirements for precision measurements in deep water used for comparison purposes*