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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 62127-2:2007/A2

June 2017

ICS 17.140.50

English Version

**Ultrasonics - Hydrophones - Part 2: Calibration for ultrasonic fields up to 40 MHz
(IEC 62127-2:2007/A2:2017)**

Ultrasons - Hydrophones - Partie 2: Etalonnage des champs ultrasoniques jusqu'à 40 Mhz
(IEC 62127-2:2007/A2:2017)

Ultraschall - Hydrophone - Teil 2: Kalibrierung für Ultraschallfelder bis zu 40 MHz
(IEC 62127-2:2007/A2:2017)

This amendment A2 modifies the European Standard EN 62127-2:2007; it was approved by CENELEC on 2017-04-26. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment 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.

[SIST EN 62127-2:2008/A2:2017](http://standards.iteh.ai)

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN 62127-2:2007/A2:2017**European foreword**

The text of document 87/612/CDV, future IEC 62127-2:2007/A2, prepared by IEC/TC 87 "Ultrasonics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62127-2:2007/A2:2017.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2018-01-26
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-04-26

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.

Endorsement notice

The text of the International Standard IEC 62127-2:2007/A2:2017 was approved by CENELEC as a European Standard without any modification.

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Addition:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61689	-	Ultrasonics - Physiotherapy systems - Field specifications and methods of measurement in the frequency range 0,5 MHz to 5 MHz	EN 61689	-

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IEC 62127-2

Edition 1.0 2017-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 2
AMENDEMENT 2

Ultrasonics – Hydrophones –
Part 2: Calibration for ultrasonic fields up to 40 MHz
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Ultrasons – Hydrophones –
Partie 2: Etalonnage des champs ultrasoniques jusqu'à 40 MHz
SIST EN 62127-2:2008/A2:2017
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FOREWORD

This amendment has been prepared by IEC technical committee 87: Ultrasonics.

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

CDV	Report on voting
87/612/CDV	87/639/RVC

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

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

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

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2 Normative references

Add the following new reference:

IEC 61689, *Ultrasonics – Physiotherapy systems – Field specifications and methods of measurement in the frequency range 0,5 MHz to 5 MHz*

3 Terms, definitions and symbols

3.26

derived instantaneous intensity

(added by Amendment 1)

Delete the following text below the term:

"approximation of the **instantaneous intensity**"

Replace the existing four lines before Equation (1) by the following:

quotient of squared instantaneous acoustic pressure and characteristic acoustic impedance of the medium at a particular instant in time at a particular point in an acoustic field

4 List of symbols

Replace:

ρc specific acoustic impedance

by

ρc characteristic acoustic impedance of the measurement liquid (water)

Add the following new symbols:

d_1 distance between the auxiliary transducer and the reflector measured along the axis of symmetry

d_h distance between the auxiliary transducer and the active element of the hydrophone measured along the axis of symmetry

d_m distance between the auxiliary transducer and the last minimum of the acoustic pressure amplitude along the axis of symmetry of the auxiliary transducer

R_{RT} amplitude reflection coefficient for the reflector/water interface

Z_{RT} characteristic acoustic impedance of the reflector

J_p reciprocity coefficient for plane waves

S_t^* apparent transmitting current response of an auxiliary transducer

M_t^* apparent receiving voltage response of an auxiliary transducer

p_a acoustic pressure generated by a transducer at its surface

p_i acoustic pressure incident on a transducer surface

p_h acoustic pressure incident on the hydrophone surface

I_t transmitting current driven to a transducer

U_t voltage generated by a transducer in the receiving mode

G_{th} correction that accounts for the diffraction in the propagation field and is related to the waveform generation by the transducer and the reception by the hydrophone

G_{tt} correction that accounts for the diffraction in the propagation field and is related to the generation and the reception by the transducer

U_{load} voltage measured with the transducer coupled to the system

I_{sc} current measured over a short circuit jumper replacing the transducer

9 Free field reciprocity calibration

9.1 General

Replace the existing text by the following:

This clause specifies the primary reference measurement procedure (see JCGM 200:2012, 2.8 [79]) calibration of **hydrophones** under **free field** conditions using the principle of reciprocity.

Add the following new note:

NOTE The free field condition can be achieved in a confined water space by following any of a variety of measurement procedures, such as with the use of tone-burst (time-gated sine wave – see 10.5.3), time-delay spectrometry [63, 68], frequency modulated chirp [80, 81] or other techniques [82].