SLOVENSKI STANDARD
SIST EN 62127-1:2008/A1:2014

01-februar-2014

Ultrazvok - Hidrofoni - 1. del: Meritve in karakterizacija medicinskih ultrazvočnih polj do 40 MHz - Dopolnilo A1 (IEC 62127-1:2007/A1:2013)

Ultrasonics - Hydrophones - Part 1: Measurement and characterization of medical ultrasonic fields up to 40 MHz

Ultraschall - Hydrophone - Teil 1: Messung und Charakterisierung von medizinischen Ultraschallfeldern bis zu 40 MHz

Ultrasons - Hydrophones - Partie 1: Mesures et caractérisation des champs ultrasonores médicaux jusqu'à 40 MHz

Ta slovenski standard je istoveten z: **EN 62127-1:2007/A1:2013**

ICS:

11.040.01	Medicinska oprema na splošno	Medical equipment in general
17.140.50	Elektroakustika	Electroacoustics

SIST EN 62127-1:2008/A1:2014 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62127-1/A1

March 2013

ICS 11.040.50

English version

Ultrasonics - Hydrophones - Part 1: Measurement and characterization of medical ultrasonic fields up to 40 MHz

(IEC 62127-1:2007/A1:2013)

Ultrasons - Hydrophones -
Partie 1: Mesurage et caractérisation des champs ultrasoniques médicaux jusqu'à 40 MHz
(CEI 62127-1:2007/A1:2013)

Ultraschall - Hydrophone -
Teil 1: Messung und Charakterisierung von medizinischen Ultraschallfeldern bis zu 40 MHz
(IEC 62127-1:2007/A1:2013)

This amendment A1 modifies the European Standard EN 62127-1:2007; it was approved by CENELEC on 2013-03-15. 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.

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CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 87/518/FDIS, future amendment 1 to edition 1 of IEC 62127-1, prepared by IEC/TC 87 "Ultrasonics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62127-1:2007/A1:2013.

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)	2013-12-15
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2016-03-15

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

Endorsement notice

The text of the International Standard IEC 62127-1:2007/A1:2013 was approved by CENELEC as a European Standard without any modification.

In the Bibliography of EN 62127-1:2007, **replace** the existing reference to IEC 61157 by the following:

IEC 61157:2007	NOTE	Harmonised as EN 61157:2007 (not modified).

In the Bibliography of EN 62127-1:2007, **add** the following new reference:

IEC/TS 61949:2007	NOTE	Harmonised as CLC/TS 61949:2008 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

Modification in Annex ZA of EN 62127-1:2007:

Publication	Year	Title	EN/HD	Year

*In Annex ZA of EN 62127-1:2007, **replace** the reference to the ISO Guide to the expression of uncertainty in measurement as follows:*

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

IEC 62127-1

Edition 1.0 2013-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

Ultrasonics – Hydrophones –
Part 1: Measurement and characterization of medical ultrasonic fields up to 40 MHz

Ultrasons – Hydrophones –
Partie 1: Mesurage et caractérisation des champs ultrasoniques médicaux jusqu'à 40 MHz

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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:

FDIS	Report on voting
87/518/FDIS	87/524/RVD

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 web site 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.

Replace throughout the document:
“non-linear” by “nonlinear”
This replacement applies to the English text only.

Replace throughout the document:
“non-linearity” by “nonlinearity”
This replacement applies to the English text only.

INTRODUCTION

Delete, in the second paragraph, the term “piezoelectric”.

Delete, in the second paragraph, the last two sentences.

1 Scope

Delete, in Note 2, the second sentence.

2 Normative references

Replace the reference to the ISO Guide to the expression of uncertainty in measurement as follows:

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

3 Terms, definitions and symbols

Replace, throughout this clause, the phrase "watts per metre squared" *by* "watts per square metre" (9 times).

Replace, throughout this clause, the phrase "metres squared" *by* "square metres" (3 times).

3.1
acoustic pulse waveform

Delete Note 2.

3.3
acoustic frequency
acoustic-working frequency

Replace, in the second sentence of Note 1," 3.3.1 and 3.3.2" *by "*3.3.1, 3.3.2, 3.3.3 and 3.3.4*".*

3.3.1
zero-crossing acoustic-working frequency
$f_{\mathbf{awf}}$

Replace the existing text of the definition by the following:

number, n, of consecutive half-cycles (irrespective of polarity) divided by twice the time between the commencement of the first half-cycle and the end of the n-th half-cycle

NOTE 1 None of the n consecutive half-cycles should show evidence of phase change.

NOTE 2 The measurement should be performed at terminals in the receiver that are as close as possible to the receiving transducer (**hydrophone**) and, in all cases, before rectification.

NOTE 3 This frequency is determined according to the procedure specified in IEC/TR 60854.

NOTE 4 This frequency is intended for continuous-wave systems only.

3.3.2
arithmetic-mean acoustic-working frequency
$f_{\mathbf{awf}}$

Add the following note to the definition:

NOTE 3 If f_2 is not found within the range < $3f_1$, f_2 is to be understood as the lowest frequency above this range at which the spectrum magnitude is 3 dB below the peak magnitude.

3.3.3
peak pulse acoustic frequency

Delete the full stop after the symbol f_p.

3.4
azimuth axis

Figure 1 – Schematic diagram of the different planes and lines in an ultrasonic field

In the figure, replace "Y" *by* "Z" *and* "Z" *by* "Y".

In the key of the figure, replace "Y beam axis" *by* "Y elevation axis" *and* "Z elevation axis" *by* "Z beam axis".

3.7
beam area

Replace the symbol by: "$\boldsymbol{A}_{b,6}$, $\boldsymbol{A}_{b,20}$*"*

Replace the existing text of Note 1 by the following:

NOTE 1 If the position of the plane is not specified, it is the plane passing through the point corresponding to the maximum value of the **pulse-pressure-squared integral** in the whole acoustic field.

*Replace, in Note 3, the word "*levels*" by "*fractions*".*

3.22
effective radius of a non-focused ultrasonic transducer

Replace the term by **effective radius of a non-focusing ultrasonic transducer**

Replace the term in the Note by **effective radius of a non-focusing ultrasonic transducer**

3.28
far field

Replace the existing text by the following:

region of the field where $z > z_T$ aligned along the **beam axis** for planar non-focusing transducers

NOTE 1 In the **far field**, the sound pressure appears to be spherically divergent from a point on or near the radiating surface. Hence the pressure produced by the sound source is approximately inversely proportional to the distance from the source.

NOTE 2 The term "**far field**" is used in this International Standard only in connection with non-focusing source transducers. For focusing transducers a different terminology for the various parts of the transmitted field applies (see IEC 61828).

NOTE 3 If the shape of the transducer aperture produces several **transition distance**s, the one furthest from the transducer is used.

3.34
instantaneous intensity

Replace the existing text of Note 1 by the following:

NOTE 1 **Instantaneous intensity** is the product of **instantaneous acoustic pressure** and particle velocity. It is difficult to measure intensity in the ultrasound frequency range. For the measurement purposes referred to in this International Standard and under conditions of sufficient distance from the **external transducer aperture** (at least one transducer diameter, or an equivalent transducer dimension in the case of a non-circular transducer) the **instantaneous intensity** can be approximated by the **derived instantaneous intensity.**

3.37
near field

Replace the existing definition and note by the following:

region of the field where $z < z_T$ aligned along the **beam axis** for planar non-focusing transducers

NOTE 1 For circular planar transducers, this is at a distance less than $A_{ob}/\pi\lambda$, where A_{ob} is the **output beam area** and λ is the wavelength of the ultrasound corresponding to the **acoustic frequency**.

NOTE 2 If the shape of the transducer aperture produces several **transition distances**, the one closest to the transducer shall be used.

3.38
non-linear propagation parameter

Replace the existing term, symbol and definition by the following:

local distortion parameter
σ_q

index which permits the prediction of nonlinear distortion of ultrasound for a specific **ultrasonic transducer,** and is given by σ_q from:

$$\sigma_q = z\, p_m \frac{2\pi f_{awf}\, \beta}{\rho \cdot c^3} \frac{1}{\sqrt{F_a}} \qquad (2)$$

where:

z is the axial distance of the point of interest to the transducer face;

p_m is the **mean-peak acoustic pressure** at the point in the acoustic field corresponding to the **spatial-peak temporal-peak acoustic pressure**;

β is the nonlinearity parameter ($\beta = 1 + B/2A = 3{,}5$ for pure water at 20 °C);

f_{awf} is the **acoustic-working frequency**;

F_a is the **local area factor** .

[SOURCE: IEC/TS 61949:2007, definition 3.12, modified – the text of the definition has changed substantially, the equation however is unchanged.]

3.43
peak acoustic pressure

Replace the existing symbol by: "p_r (or p_-) or p_c (or p_+)".

3.44
peak-rarefactional acoustic pressure

Replace the existing symbol by: "p_r (or p_-)"

3.45
peak-compressional acoustic pressure

Replace symbol by: "p_c (or p_+)"

3.47
pulse-average intensity
I_{pa}

Replace, in the definition, the word "ratio" *by* "quotient".

Add the following new note and number the existing note as Note 2.:

NOTE 1 This definition applies to pulses and bursts.

3.51
pulse repetition period

Delete, in Note 1, the second sentence ("See also IEC 60469-1:1987, 5.3.2.1.").

3.52
pulse repetition rate

Delete Note 1.

Renumber Note 2 *as* Note.