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Ultraljud – Effektmätning – Stråltrycksvågar och prestandaforordringar

*Ultrasonics –
Power measurement –
Radiation force balances and performance requirements*

Som svensk standard gäller europastandarden EN 61161:2007. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61161:2007.

Nationellt förord

Europastandarden EN 61161:2007

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 61161, Second edition, 2006 - Ultrasonics - Power measurement - Radiation force balances and performance requirements**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61161, utgåva 1, 1995 och SS-EN 61161/A1, utgåva 1, 1998, gäller ej fr o m 2010-03-01.

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

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Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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English version

**Ultrasonics -
Power measurement -
Radiation force balances and performance requirements
(IEC 61161:2006)**

Ultrasons -
Mesurage de puissance -
Balances de forces de rayonnement
et exigences de fonctionnement
(CEI 61161:2006)

Ultraschall -
Leistungsmessung -
Schallfeldkraft-Waagen
und Anforderungen an ihre
Funktionseigenschaften
(IEC 61161:2006)

This European Standard was approved by CENELEC on 2007-03-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard 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 Central Secretariat or to any CENELEC member.

This European Standard 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 Central Secretariat has the same status as the official versions.

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

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 87/325/CDV, future edition 2 of IEC 61161, prepared by IEC TC 87, Ultrasonics, was submitted to the IEC-CENELEC parallel Unique Acceptance Procedure and was approved by CENELEC as EN 61161 on 2007-03-01.

This European Standard supersedes EN 61161:1994 + A1:1998.

The main significant changes are:

- the main body of the standard has been restricted to normative statements;
- informative statements on corresponding aspects of ultrasonic power measurement and radiation force balances have been collected in Annex A;
- Annexes A, D, E and F are new;
- more radiation force balance arrangements are dealt with. The new material relates particularly to power measurement of ultrasonic physiotherapy devices.

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement | (dop) | 2007-12-01 |
| – latest date by which the national standards conflicting
with the EN have to be withdrawn | (dow) | 2010-03-01 |

The following print types are used:

- requirements: roman type;
- notes: small roman type;
- words in **bold** in the text are defined in Clause 3.

The numbers in square brackets refer to the Bibliography (after the annexes).

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61161:2006 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60601-2-5	NOTE Harmonized as EN 60601-2-5:2000 (not modified).
IEC 61157	NOTE Harmonized as EN 61157:1994 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-801	- ¹⁾	International Electrotechnical Vocabulary (IEV) - Chapter 801: Acoustics and electroacoustics	-	-
IEC 60854	1986	Methods of measuring the performance of ultrasonic pulse-echo diagnostic equipment	-	-
IEC 60866	1987	Characteristics and calibration of hydrophones for operation in the frequency range 0,5 MHz to 15 MHz	-	-
IEC 61101	1991	The absolute calibration of hydrophones using the planar scanning technique in the frequency range 0,5 MHz to 15 MHz	EN 61101	1993
IEC 61102	1991	Measurement and characterisation of ultrasonic fields using hydrophones in the frequency range 0,5 MHz to 15 MHz	EN 61102	1993
IEC 61689	1996	Ultrasonics - Physiotherapy systems - Performance requirements and methods of measurement in the frequency range 0,5 MHz to 5 MHz	EN 61689	1996
IEC 61846	1998	Ultrasonics - Pressure pulse lithotripters - Characteristics of fields	EN 61846	1998

¹⁾ Undated reference.

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ULTRASONICS – POWER MEASUREMENT – RADIATION FORCE BALANCES AND PERFORMANCE REQUIREMENTS

1 Scope

This International Standard

- specifies a method of determining the total emitted acoustic power of ultrasonic transducers based on the use of a radiation force balance;
- establishes general principles for the use of radiation force balances in which an obstacle (target) intercepts the sound field to be measured;
- establishes limitations of the radiation force method related to cavitation and temperature rise;
- establishes quantitative limitations of the radiation force method in relation to diverging and focused beams;
- provides information on assessment of overall measurement uncertainties.

This International Standard is applicable to:

- the measurement of ultrasonic power up to 1 W based on the use of a radiation force balance in the frequency range from 0,5 MHz to 25 MHz;
- the measurement of ultrasonic power up to 20 W based on the use of a radiation force balance in the frequency range 0,75 MHz to 5 MHz;
- the measurement of total ultrasonic power of transducers, preferably with well-collimated beams;
- the use of radiation force balances of the gravimetric type or force feedback type.

NOTE The titles of all publications referred to in this Standard are listed in the Bibliography.

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 60050, *International Electrotechnical Vocabulary (IEV) – Chapter 801: Acoustics and Electroacoustics, Chapter 802: Ultrasonics*

IEC 60854:1986, *Methods of measuring the performance of ultrasonic pulse-echo diagnostic equipment*

IEC 60866:1987, *Characteristics and calibration of hydrophones for operation in the frequency range 0,5 MHz to 15 MHz*

IEC 61101:1991, *The absolute calibration of hydrophones using the planar scanning technique in the frequency range 0,5 MHz to 15 MHz*

IEC 61102:1991, *Measurement and characterisation of ultrasonic fields using hydrophones in the frequency range 0,5 MHz to 15 MHz*

IEC 61689:1996, *Ultrasonics – Physiotherapy systems – Performance requirements and methods of measurement in the frequency range 0,5 MHz to 5 MHz*

IEC 61846:1998, *Ultrasonics – Pressure pulse lithotripters – Characteristics of fields*