BS EN 61094-3:2016

BSI Standards Publication

Electroacoustics — Measurement microphones

Part 3: Primary method for free-field calibration of laboratory standard microphones by the reciprocity technique

bsi.

National foreword

This British Standard is the UK implementation of EN 61094-3:2016. It is identical to IEC 61094-3:2016. It supersedes BS EN 61094-3:1996 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/29, Electroacoustics.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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English Version

Electroacoustics - Measurement microphones - Part 3: Primary method for free-field calibration of laboratory standard microphones by the reciprocity technique (IEC 61094-3:2016)

Électroacoustique - Microphones de mesure - Partie 3: Méthode primaire pour l'étalonnage en champ libre des microphones étalons de laboratoire par la méthode de réciprocité (IEC 61094-3:2016)

Messmikrofone - Teil 3: Primärverfahren zur Freifeld-Kalibrierung von Laboratoriums-Normalmikrofonen nach der Reziprozitätsmethode (IEC 61094-3:2016)

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

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European foreword

The text of document 29/873/CDV, future edition 2 of IEC 61094-3, prepared by IEC TC 29, Electroacoustics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61094-3:2016.

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)	2017-04-19
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2019-07-19

This document supersedes EN 61094-3:1995.

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 61094-3:2016 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 61094-8:2012	NOTE	Harmonized as EN 61094-8:2012.

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.

Publication	Year	Title	EN/HD	Year
IEC 61094-1	2000	Measurement microphones -- Part 1: Specifications for laboratory standard microphones	EN 61094-1	2000
IEC 61094-2	2009	Electroacoustics - Measurement microphones -- Part 2: Primary method for the pressure calibration of laboratory standard microphones by the reciprocity technique	EN 61094-2	2009
ISO 9613-1	-	Acoustics; attenuation of sound during propagation outdoors; part_1: calculation of the absorption of sound by the atmosphere	-	-
IEC/TS 61094-7	-	Measurement microphones -- Part 7: Values for the difference between free-field and pressure sensitivity levels of laboratory standard microphones	-	-
ISO/IEC Guide 98-3	-	Uncertainty of measurement - Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)	-	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTROACOUSTICS – MEASUREMENT MICROPHONES –

Part 3: Primary method for free-field calibration of laboratory standard microphones by the reciprocity technique

FOREWORD

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International Standard IEC 61094-3 has been prepared by IEC technical committee 29: Electroacoustics.

This second edition cancels and replaces the first edition published in 1995. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) a new informative annex describing the use of time-selective techniques to minimize the influence of acoustic reflections from the measurement setup;
b) provision for the calibration of microphones in driven shield configuration.

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

CDV	Report on voting
29/873/CDV	29/892A/RVC

Full information on the voting for the approval of this standard 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 61094 series, published under the general title *Electroacoustics – Measurement microphones*, 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 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.

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.

ELECTROACOUSTICS – MEASUREMENT MICROPHONES –

Part 3: Primary method for free-field calibration of laboratory standard microphones by the reciprocity technique

1 Scope

This part of IEC 61094

- specifies a primary method of determining the complex free-field sensitivity of laboratory standard microphones so as to establish a reproducible and accurate basis for the measurement of sound pressure under free-field conditions,
- is applicable to laboratory standard microphones meeting the requirements of IEC 61094-1,
- is intended for use by laboratories with highly experienced staff and specialized equipment.

NOTE The calibration principle described in this part of IEC 61094 is also applicable to working standard microphones, preferably used without their protection grid.

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 61094-1:2000, *Measurement microphones – Part 1: Specifications for laboratory standard microphones*

IEC 61094-2:2009, *Electroacoustics – Measurement microphones – Part 2: Primary method for pressure calibration of laboratory standard microphones by the reciprocity technique*

IEC TS 61094-7:2006, *Measurement microphones – Part 7: Values for the difference between free-field and pressure sensitivity levels of laboratory standard microphones*

ISO 9613-1, *Acoustics – Attenuation of sound during propagation outdoors – Part 1: Calculation of the absorption of sound by the atmosphere*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61094-1, IEC 61094-2, ISO/IEC Guide 98-3 and the following apply.

3.1
phase
<free-field sensitivity of a microphone> phase angle between the open-circuit voltage and the sound pressure that would exist at the position of the acoustic centre of the microphone in the absence of the microphone, for a sinusoidal plane progressive wave of given frequency and direction of sound incidence, and for given environmental conditions