



**NSAI**  
Standards

Irish Standard  
I.S. EN 60689:2009

Measurement and test methods for  
tuning fork quartz crystal units in the  
range from 10 kHz to 200 kHz and  
standard values (IEC 60689:2008 (EQV))

## I.S. EN 60689:2009

*Incorporating amendments/corrigenda issued since publication:*

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Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD

**EN 60689**

NORME EUROPÉENNE

March 2009

EUROPÄISCHE NORM

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ICS 31.140

English version

**Measurement and test methods for tuning fork quartz crystal units  
in the range from 10 kHz to 200 kHz and standard values  
(IEC 60689:2008)**

Méthodes de mesure et  
d'essai concernant le réglage  
des résonateurs à quartz  
dans la plage comprise entre  
10 kHz et 200 kHz et valeurs normales  
(CEI 60689:2008)

Mess- und Prüfverfahren  
für Stimmgabelquarze  
im Frequenzbereich  
von 10 kHz bis 200 kHz  
sowie Richtwerte  
(IEC 60689:2008)

This European Standard was approved by CENELEC on 2009-03-01. 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: avenue Marnix 17, B - 1000 Brussels**

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## Foreword

The text of document 48/809/FDIS, future edition 2 of IEC 60689, prepared by IEC TC 49, Piezoelectric and dielectric devices for frequency control and selection, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60689 on 2009-03-01.

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) 2009-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2012-03-01

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 60689:2008 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 60068-1	NOTE Harmonized as EN 60668-1:1994 (not modified).
IEC 60068-2-1	NOTE Harmonized as EN 60668-2-1:2007 (not modified).
IEC 60068-2-2	NOTE Harmonized as EN 60668-2-2:2007 (not modified).
IEC 60068-2-7	NOTE Harmonized as EN 60668-2-7:1993 (not modified).
IEC 60068-2-13	NOTE Harmonized as EN 60668-2-13:1999 (not modified).
IEC 60068-2-14	NOTE Harmonized as EN 60668-2-14:1999 (not modified).
IEC 60068-2-17	NOTE Harmonized as EN 60668-2-17:1994 (not modified).
IEC 60068-2-20	NOTE Harmonized as EN 60668-2-20:2008 (not modified).
IEC 60068-2-21	NOTE Harmonized as EN 60668-2-21:2006 (not modified).
IEC 60068-2-27	NOTE Harmonized as EN 60668-2-27:1993 (not modified).
IEC 60068-2-30	NOTE Harmonized as EN 60668-2-30:2005 (not modified).
IEC 60068-2-31	NOTE Harmonized as EN 60668-2-31:2008 (not modified).
IEC 60068-2-45	NOTE Harmonized as EN 60668-2-45:1992 (not modified).
IEC 60068-2-78	NOTE Harmonized as EN 60668-2-78:2001 (not modified).

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## 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 60027	Series	Letter symbols to be used in electrical technology	EN 60027	Series
IEC 60050-561	- <sup>1)</sup>	International Electrotechnical Vocabulary (IEV) - Chapter 561: Piezoelectric devices for frequency control and selection	-	-
IEC 60122-1	- <sup>1)</sup>	Quartz crystal units of assessed quality - Part 1: Generic specification	EN 60122-1	2002 <sup>2)</sup>
IEC 60122-3	- <sup>1)</sup>	Quartz crystal units of assessed quality - Part 3: Standard outlines and lead connections	EN 60122-3	2001 <sup>2)</sup>
IEC 60444	Series	Measurement of quartz crystal unit parameters by zero phase technique in a pi-network	EN 60444	Series
IEC 60617	Data-base	Graphical symbols for diagrams	-	-
ISO 1000	1992	SI units and recommendations for the use of their multiples and of certain other units	-	-

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<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### **MEASUREMENT AND TEST METHODS FOR TUNING FORK QUARTZ CRYSTAL UNITS IN THE RANGE FROM 10 kHz TO 200 kHz AND STANDARD VALUES**

#### FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60689 has been prepared by IEC technical committee 49: Piezoelectric and dielectric devices for frequency control and selection.

This second edition cancels and replaces the first edition published in 1980. This edition constitutes a technical revision.

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

- a) The title of the first edition is *Measurements and test methods for 32 kHz quartz crystal units for wrist watches and standard values*. The title is modified and the frequency range of this second edition is extended to the range from 10 kHz to 200 kHz.
- b) The Lissajous method is defined in the first edition as the standard measurement method. The PI network and bridge method are used in this second edition.
- c) The PI network has a transformer for impedance matching. This composition differs from that of IEC 60444-1.



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

FDIS	Report on voting
49/809/FDIS	49/815/RVD

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.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

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

# MEASUREMENT AND TEST METHODS FOR TUNING FORK QUARTZ CRYSTAL UNITS IN THE RANGE FROM 10 kHz TO 200 kHz AND STANDARD VALUES

## 1 Scope

This International Standard applies to measurements and test methods for tuning fork quartz crystal units in the range from 10 kHz to 200 kHz and standard values for frequency control and selection.

## 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 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60050-561, *International Electrotechnical Vocabulary – Chapter 561: Piezoelectric devices for frequency control and selection*

IEC 60122-1, *Quartz crystal units of assessed quality – Part 1: Generic specification*

IEC 60122-3, *Quartz crystal units of assessed quality – Part 3: Standard outlines and lead connections*

IEC 60444 (series), *Measurement of quartz crystal unit parameters by zero phase technique in a  $\pi$ -network*

IEC 60617, *Graphical symbols for diagrams*

ISO 1000:1992, *SI units and recommendations for the use of their multiples and certain other Units*

## 3 Overview

### 3.1 General

Units, graphical symbols, letter symbols and terminology shall, wherever possible, be taken from the following standards: IEC 60027, IEC 60050-561, IEC 60122-1, IEC 60617, and ISO 1000.

### 3.2 Applied frequency range

The frequency range is from 10 kHz to 200 kHz.

### 3.3 Measurement method

The measurement method is according to the IEC 60444 series.

It is permitted to use the bridge method as a simple measuring method.

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