# IEC TS 61994-5

Edition 2.0 2023-09

# TECHNICAL SPECIFICATION

## Piezoelectric, dielectric and electrostatic devices and associated materials for frequency control, selection and detection – Glossary – Part 5: Piezoelectric sensors



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## Piezoelectric, dielectric and electrostatic devices and associated materials for frequency control, selection and detection – Glossary – Part 5: Piezoelectric sensors

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# PIEZOELECTRIC, DIELECTRIC AND ELECTROSTATIC DEVICES AND ASSOCIATED MATERIALS FOR FREQUENCY CONTROL, SELECTION AND DETECTION – GLOSSARY –

## Part 5: Piezoelectric sensors

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IEC TS 61944-5 has been prepared by IEC technical committee 49: Piezoelectric, dielectric and electrostatic devices and associated materials for frequency control, selection and detection. It is a Technical Specification.

This second edition cancels and replaces the first edition published in 2019. This edition constitutes a technical revision.

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

a) New terms and definitions have been added from IEC 63041-1:2021 and IEC 63041-3:2020.

The text of this Technical Specification is based on the following documents:

| Draft | Report on voting |
|---|---|
| 49/1421/DTS | 49/1439/RVDTS |

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

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 61994 series, published under the general title *Piezoelectric, dielectric and electrostatic devices and associated materials for frequency control, selection and detection – Glossary*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

# PIEZOELECTRIC, DIELECTRIC AND ELECTROSTATIC DEVICES AND ASSOCIATED MATERIALS FOR FREQUENCY CONTROL, SELECTION AND DETECTION – GLOSSARY –

## Part 5: Piezoelectric sensors

## 1 Scope

This part of IEC 61994 gives the terms and definitions for sensors representing the state of the art, which are intended for manufacturing piezoelectric elements, cells, modules and the systems.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

**3.1**
**delay line type sensor element**
piezoelectric sensor component using a delay line of SAW transversal filter type

[SOURCE: IEC 63041-1:2021, 3.1.3, modified – "surface acoustic wave (SAW) transversal filter type" of the definition has been replaced by "SAW transversal filter type".]

**3.2**
**differential sensor**
piezoelectric sensor element that can detect physical quantities from a differential change in resonance frequencies or delays of two independent and same micro-acoustic structures assembled on the same or different piezoelectric plates

Note 1 to entry: The differential sensor is a general term for sensors of the above type.

[SOURCE: IEC 63041-3:2020, 3.1.6, modified – "piezoelectric sensor which is able to" of the definition has been replaced by "piezoelectric sensor element that can". "from a change in resonance frequencies" has been replaced by "from a differential change in resonance frequencies".]

**3.3**
**dual mode sensor**
piezoelectric sensor element that can detect physical quantities from a change in resonance frequencies of two independent modes on a single piezoelectric plate

Note 1 to entry: In order to achieve improved precision and/or to eliminate undesirable influence factors, sensor solutions are employed that utilize two or more modes. By evaluation of combinations of those modes' sensitivities to various ambient conditions, improved detection sensitivity can be achieved, whereas undesirable sensitivities can be reduced or eliminated.

Note 2 to entry: The dual mode sensor is a general term for sensors of the above type

[SOURCE: IEC 63041-3:2020, 3.1.5, modified – "piezoelectric sensor which is able to" of definition has been replaced by "piezoelectric sensor element that can". Note 1 to entry has been rewritten. Note 2 to entry has been added.]

**3.4**
**dual mode sensor module**
dual mode sensor element or cell equipped with circuit units for temperature compensation and electronic accessories for interfacing to external data acquisitions

[SOURCE: IEC 63041-1:2021, 3.4.2, modified – The note to entry has been removed.]

**3.5**
**dual mode sensor system**
system that consists of dual mode sensor modules, electronic devices, PCs, memory, wired or wireless devices, software, etc.

Note 1 to entry: The dual mode quartz crystal sensor system is used in oil-well exploration and gas-well exploration systems.

[SOURCE: IEC 63041-1:2021, 3.5.2, modified – Since the dual mode sensor is not necessarily limited to quartz crystal-based sensors, the definition was rewritten as above.]

**3.6**
**multi-measurand sensor**
piezoelectric sensor element that can detect two or more different physical quantities from an analysis of different sensor responses

Note 1 to entry: The multi-measurand sensor is a general term for sensors of the above type,

[SOURCE: IEC 63041-3:2020, 3.1.7, modified – The words "piezoelectric sensor which is able to" of the definition have been replaced by "piezoelectric sensor element that can". Note 1 to entry has been added.]

**3.7**
**piezoelectric acceleration sensor element**
piezoelectric sensor component whose resonance frequency or delay is used to measure the change in velocity of an object with time

[SOURCE: IEC 63041-3:2020, 3.1.1]