
**Vacuum technology — Vacuum
gauges — Evaluation of the uncertainties
of results of calibrations by direct
comparison with a reference gauge**

*Technique du vide — Manomètres à vide — Évaluation de l'incertitude
des résultats des étalonnages par comparaison directe avec un
manomètre de référence*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 27893 was prepared by Technical Committee ISO/TC 112, *Vacuum technology*.

This first edition of ISO 27893 cancels and replaces the first edition of ISO/TS 27893:2009, which has been technically revised.

Vacuum technology — Vacuum gauges — Evaluation of the uncertainties of results of calibrations by direct comparison with a reference gauge

1 Scope

This International Standard gives guidelines for the determination and reporting of measurement uncertainties arising during vacuum gauge calibration by direct comparison with a reference gauge carried out in accordance with ISO/TS 3567.

This International Standard describes methods for uniform reporting of uncertainties in vacuum gauge certificates. Uncertainties reported in accordance with the guidelines given in this International Standard are transferable in the sense that the uncertainty evaluated for one result can be used as a component in the uncertainty evaluation of another measurement or calibration in which the first result is used.

This International Standard defines two measurement models that are sufficient to cover most practical cases. However, it is possible that the models given cannot be applied to newly developed vacuum gauges.

The final uncertainty to be reported in a certificate is evaluated from the uncertainties of the input quantities and influence quantities. The principal quantities that can affect the result of a vacuum calibration are described; however, a complete list of the possible quantities that can have an influence on the final result lies outside the scope of this International Standard.

NOTE It is envisaged that future Technical Specifications will address the calibration of specific types of vacuum gauges.

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.

ISO/TS 3567, *Vacuum gauges — Calibration by direct comparison with a reference gauge*

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

ISO/IEC Guide 99:2007, *International vocabulary of metrology — Basic and general concepts and associated terms (VIM)*