
**Vacuum technology — Vacuum
gauges — Specifications, calibration
and measurement uncertainties for
capacitance diaphragm gauges**

*Technique du vide — Manomètres à vide — Spécifications, étalonnage
et incertitudes de mesure des manomètres capacitifs à membrane*



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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

ISO 3567, *Calibration by direct comparison with a reference gauge*, and ISO 27893, *Evaluation of the uncertainties of results of calibrations by direct comparison with a reference gauge*, were published in 2011 and in 2009, respectively. Detailed guidance for a specific gauge is intended to be given in separate international standards or technical specifications for the calibration of special types of gauges.

This document complements ISO 3567 and ISO 27893 when characterizing, calibrating or using capacitance diaphragm gauges (CDGs) as reference gauges.

CDGs are widely used to measure pressures in the medium vacuum up to atmospheric pressure. For the dissemination of the pressure scale and measurement of low and medium vacuum pressures by this gauge, the relevant parameters, calibration guidelines and uncertainties are described in this document.

Vacuum technology — Vacuum gauges — Specifications, calibration and measurement uncertainties for capacitance diaphragm gauges

1 Scope

This document defines terms related to capacitance diaphragm gauges (CDGs), specifies which parameters have to be given for CDGs, details their calibration procedure and describes which measurement uncertainties have to be considered when operating these gauges.

This document complements ISO 3567 and ISO 27893 when calibrating CDGs and using them as reference standards.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 3529-1, *Vacuum technology — Vocabulary — Part 1: General terms*

ISO 3529-3, *Vacuum technology — Vocabulary — Part 3: Total and partial pressure vacuum gauges*

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

ISO 27893, *Vacuum technology — Vacuum gauges — Evaluation of the uncertainties of results of calibrations 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, *International vocabulary of metrology — Basic and general concepts and associated terms (VIM)*

3 Terms and definitions

For the purposes of this document the terms and definitions given in ISO 3529-1, ISO 3529-3, ISO 3567, ISO 27893, ISO/IEC Guide 98-3, ISO/IEC Guide 99 and the following apply.

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

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

3.1 Components

3.1.1

diaphragm

membrane

elastic element which deforms under differential pressure applied to it