



**International
Standard**

ISO 3567

**Vacuum gauges — Calibration by
direct comparison with a reference
gauge**

*Manomètres — Étalonnage par comparaison directe avec un
manomètre de référence*

**Second edition
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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and abbreviated terms	4
5 General principle	4
6 Requirements	5
6.1 Design of calibration chamber	5
6.2 Plumbing of gauges to calibration chamber	6
6.3 Vacuum and gas inlet system	6
6.4 Calibration gas	7
6.5 Thermometers and ambient conditions	7
6.6 Reference gauge	7
7 Calibration	8
7.1 Procedure	8
7.2 Evaluation of measurements	10
7.3 Measurement uncertainty	10
8 Calibration certificate	10
Annex A (informative) Example of possible calibration system set-up	12
Annex B (informative) Problems in practice	13
Bibliography	15

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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 document 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).

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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*.

This second edition cancels and replaces the first edition (ISO 3567:2011) which has been technically revised.

The main changes are as follows:

- [Clause 1](#), scope modified;
- [Clause 3](#), terms added;
- [Subclause 6.2.1](#), requirements for tubing modified;
- [Subclause 6.2.4](#), requirement for leak testing added;
- [Subclause 6.3.2](#), recommendation to use turbomolecular pump added for the stationary equilibrium method;
- [Subclause 6.3.4](#), requirements for the vacuum gauge to measure base pressure clarified;
- [Subclause 6.6](#), requirements for the reference gauge modified;
- [Subclause 7.1.5](#), recommended pressure ranges for static method and stationary equilibrium method added;
- [Subclause 7.1.8](#), requirements for repeated calibration added;
- [Clause 8](#), items in calibration certificate modified.

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

The document aims to establish the physical, technical and metrological conditions necessary for adequately disseminating the pressure scale in the vacuum regime by calibration with a reference gauge. It is assumed that users are familiar with the general procedures of vacuum generation and measurement in the vacuum ranges considered.

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Vacuum gauges — Calibration by direct comparison with a reference gauge

1 Scope

This document specifies the physical, technical and metrological conditions to be fulfilled when calibrations of vacuum gauges are performed by direct comparison with a reference gauge at a calibration laboratory, whether accredited or not. From the conditions described, the design of an apparatus that can perform vacuum gauge calibrations in an adequate manner can be deduced.

This document is applicable for calibration of all types of vacuum gauges. Vacuum gauges can consist of several parts; typically, these are: gauge head, cable, and control unit. This entire set is considered as the unit to be calibrated. If only the gauge head (i.e. the part of the vacuum gauge directly exposed to the vacuum) is calibrated, all set-ups and conditions are recorded such that the user of the calibrated gauge head is able to perform the measurements in the same manner as during the calibration.

This document does not give guidance on how to treat special types of vacuum gauges, be they reference standards or units under calibration.

The applicable pressure range for calibrations treated in this document depends on the realized design of the calibration apparatus and on the type of reference gauge, and the range varies in its limits from 10^{-6} Pa to 133 kPa.

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

ISO/IEC 17025:2017, *General requirements for the competence of testing and calibration laboratories*

ISO 27893, *Vacuum technology — Vacuum gauges — Evaluation of the uncertainties of results of calibrations by direct comparison with a reference gauge*

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:

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

3.1

primary standard

measurement standard established using a primary reference measurement procedure

[SOURCE: ISO/IEC Guide 99:2007, 5.4, modified — revised for simplification.]