
Vacuum gauges — Calibration by direct comparison with a reference gauge

Manomètres — Étalonnage par comparaison directe avec un manomètre de référence



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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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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.

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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.

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An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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ISO/TS 3567 was prepared by Technical Committee ISO/TC 112, *Vacuum technology*.

Introduction

The purpose of this Technical Specification is 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 the user will be 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 Technical Specification lays down the physical, technical and metrological conditions to be fulfilled when calibrations of vacuum gauges are performed by direct comparison with a reference gauge. From the conditions described can be deduced how to design an apparatus that can perform vacuum gauge calibrations in an adequate manner.

The vacuum gauges to be calibrated can be of any kind. Many types of gauges consist of several parts. Typically, these are gauge head, cable, operational device and signal read out. This whole set is considered as the unit that has to be calibrated. Whereas, if only the gauge head (i.e. that part of the vacuum gauge directly exposed to the vacuum) is calibrated, all set-ups and conditions would have to be recorded such that the user of the calibrated gauge head would be able to perform the measurements in the same manner as during the calibration.

The reference gauge is either a calibrated gauge traceable to a vacuum primary or national standard (normal case), with a calibration certificate according to ISO/IEC 17025, or an absolutely measuring instrument (rare case), traceable to the SI units and to which a measurement uncertainty can be attributed.

This Technical Specification does not give guidance on how to treat special types of vacuum gauges, be they reference standards or units under calibration, and it is intended that such guidance be given in other technical specifications.

The pressure range for calibrations treated in this Technical Specification depends on the realised design of the calibration apparatus and on the type of reference gauge. The range varies in its limits from 10^{-6} Pa to 110 kPa.

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/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories*

ISO/IEC Guide to the expression of uncertainty in measurement (GUM), BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, OIML, 1st edition 1993, corrected and reprinted in 1995

3 Terms and definitions

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

3.1

primary standard

standard designated or widely acknowledged as having the highest metrological qualities and whose value is accepted without reference to other standards of the same quantity in the same range