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Vacuum gauges — Calibration by direct comparison with a reference gauge

Manomètres — Étalonnage 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 3567 was prepared by Technical Committee ISO/TC 112, *Vacuum technology*.

This first edition of ISO 3567 cancels and replaces ISO/TS 3567:2005, of which it constitutes a technical revision.

Introduction

The purpose of this International Standard 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.

Vacuum gauges — Calibration by direct comparison with a reference gauge

1 Scope

This International Standard specifies 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, the design of an apparatus that can perform vacuum gauge calibrations in an adequate manner can be deduced.

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 entire set is considered as the unit that has to be calibrated. Whereas, 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 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 absolute measuring instrument (rare case), traceable to the SI units and to which a measurement uncertainty can be attributed.

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

The pressure range for calibrations treated in this International Standard depends on the realized 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 Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

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

3 Terms and definitions

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

3.1
primary standard
measurement standard established using a primary reference measurement procedure

[SOURCE: ISO/IEC Guide 99:2007, 5.4, modified]

3.2
national standard
measurement standard recognized by national authority to serve in a state or economy as the basis for assigning quantity values to other measurement standards for the kind of quantity concerned

[SOURCE: ISO/IEC Guide 99:2007, 5.3]