
**Measurement of fluid flow by means of
pressure differential devices —
Guidelines on the effect of departure from
the specifications and operating
conditions given in ISO 5167**

*Mesurage du débit des fluides au moyen d'appareils déprimogènes —
Lignes directrices relatives aux effets des divergences par rapport aux
spécifications et aux conditions de fonctionnement données dans
l'ISO 5167*



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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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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/TR 12767 was prepared by Technical Committee ISO/TC 30, *Measurement of fluid flow in closed conduits*, Subcommittee SC 2, *Pressure differential devices*.

This second edition cancels and replaces the first edition (ISO/TR 12767:1998), which has been technically revised.

Introduction

ISO 5167 (all parts) specifies methods for flowrate measurement using pressure differential devices. Adherence to ISO 5167 (all parts) results in flowrate measurements whose uncertainty lies within specified limits. If, however, a flow-metering installation departs, for whatever reason, from the conditions specified in ISO 5167 (all parts), the specified limits of uncertainty may not be achieved. Many metering installations exist where these conditions either have not been or cannot be met. In these circumstances, it is usually not possible to evaluate the precise effect of any such deviations. However, a considerable amount of data exists which can be used to give a general indication of the effect of non-conformity to ISO 5167 (all parts), and it is presented in this Technical Report as a guideline to users of flow-metering equipment.

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Measurement of fluid flow by means of pressure differential devices — Guidelines on the effect of departure from the specifications and operating conditions given in ISO 5167

1 Scope

This Technical Report provides guidance on estimating the flowrate when using pressure differential devices constructed or operated outside the scope of ISO 5167.

Additional tolerances or corrections cannot necessarily compensate for the effects of deviating from ISO 5167 (all parts). The information is given, in the first place, to indicate the degree of care necessary in the manufacture, installation and maintenance of pressure differential devices by describing some of the effects of non-conformity to the requirements; and in the second place, to permit those users who cannot comply fully with the requirements to assess, however roughly, the magnitude and direction of the resulting error in flowrate.

Each variation dealt with is treated as though it were the only one present. Where more than one is known to exist, there may be unpredictable interactions and care has to be taken when combining the assessment of these errors. If there is a significant number of errors, means of eliminating some of them have to be considered. The variations included in this Technical Report are by no means complete and relate largely to examples with orifice plates. An example with Venturi tubes has been placed at the end of its section. There are, no doubt, many similar examples of installations not conforming to ISO 5167 (all parts) for which no comparable data have been published. Such additional information from users, manufacturers and any others may be taken into account in future revisions of this Technical Report.

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 5167-1:2003, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 1: General principles and requirements*

ISO 5167-2:2003, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 2: Orifice plates*

ISO 5167-3:2003, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 3: Nozzles and Venturi nozzles*

ISO 5167-4:2003, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 4: Venturi tubes*