STANDARD **9951**

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# Measurement of gas flow in closed conduits — Turbine meters

*Mesure de débit de gaz dans les conduites fermées — Compteurs à turbine*

Reference number
ISO 9951:1993(E)

# Contents





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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.

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.

International Standard ISO 9951 was prepared by Technical Committee ISO/TC 30, *Measurement of fluid flow in closed conduits*, Sub-Committee SC 10, *Turbine meters*.

Annexes A, B, C, D and E of this International Standard are for information only.

# Measurement of gas flow in closed conduits — Turbine meters

## 1 Scope

This International Standard specifies dimensions, ranges, construction, performance, calibration and output characteristics of turbine meters for gas flow measurement.

It also deals with installation conditions, leakage testing and pressure testing and provides a series of informative annexes A to E including recommendations for use, field checks and perturbations of the fluid flowing.

In many countries, some or all of the items covered by this International Standard are subject to mandatory regulations imposed by the laws of these countries. In cases where conflict exists between such mandatory regulations and this International Standard, the former shall prevail.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3:1973, *Preferred numbers — Series of preferred numbers.*

ISO 4006:1991, *Measurement of fluid flow in closed conduits — Vocabulary and symbols.*

ISO 5167-1:1991, *Measurement of fluid flow by means of pressure differential devices — Part 1: Orifice plates, nozzles and Venturi tubes inserted in circular cross-section conduits running full.*

ISO 5168:1978, *Measurement of fluid flow — Estimation of uncertainty of a flow-rate measurement.*

ISO 5208:1993, *Industrial valves — Pressure testing of valves.*

ISO 6708:1980, *Pipe components — Definition of nominal size.*

IEC 79:—, *Electrical apparatus for explosive gas atmospheres.*

OIML R 6:1989, *General provisions for gas meters.*

OIML R 32:1989, *Rotary piston gas meters and turbine gas meters.*

VIM:1984, *International vocabulary of basic and general terms in metrology* (BIPM, IEC, ISO, OIML).

## 3 Definitions and symbols

### 3.1 Definitions

For the purposes of this International Standard, the definitions given in ISO 4006 and the International vocabulary of basic and general terms in metrology apply. The following definitions are given only for terms used in some special sense or for terms whose meaning it seems useful to recall.

**3.1.1 flowrate**: Actual volume of flow per unit of time.

**3.1.2 working range**: Range of flowrates of gas limited by the maximum flowrate $q_{max}$ and the minimum flowrate $q_{min}$, for which the meter error lies within specified limits (sometimes also called "rangeability").

**3.1.3 metering pressure**: Gas pressure in a meter to which the indicated volume of gas is related.