STANDARD **9368-1**

First edition
1990-12-01

Measurement of liquid flow in closed conduits by the weighing method — Procedures for checking installations —

Part 1:
Static weighing systems

Mesure de débit des liquides dans les conduites fermées par pesée — Contrôle des installations de mesure —

Partie 1: Installations statiques

Reference number
ISO 9368-1 : 1990 (E)

Contents

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Printed in Switzerland

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 9368-1 was prepared by Technical Committee ISO/TC 30, *Measurement of fluid flow in closed conduits*.

ISO 9368 will consist of the following parts, under the general title *Measurement of liquid flow in closed conduits by the weighing method — Procedures for checking installations*:

— *Part 1: Static weighing systems*

— *Part 2: Dynamic weighing systems*

Annexes A, B, C, D and E form an integral part of this part of ISO 9368. Annex F is for information only.

Introduction

The weighing method of liquid flowrate measurement, as described in ISO 4185, is one of the basic methods of measurement. It is widely used in hydraulic research, in the testing of pumps and turbines and for flowmeter calibration.

To obtain comparative results when such measurements are carried out in various installations, it is necessary to standardize the procedures for carrying out the measurements and the tests.

Measurement of liquid flow in closed conduits by the weighing method — Procedures for checking installations —

Part 1:
Static weighing systems

1 Scope

This part of ISO 9368 specifies methods of testing installations for flowrate measurement by the static weighing method. Methods of testing by dynamic weighing are given in ISO 9368-2.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 9368. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9368 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 4006 : —[1], *Measurement of fluid flow in closed conduits — Vocabulary and symbols.*

ISO 4185 : 1980, *Measurement of liquid flow in closed conduits — Weighing method.*

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

OIML — International Recommendation 33 : 1973, *Conventional values of the result of weighing in air.*

3 Definitions and symbols

3.1 Definitions

For the purposes of this part of ISO 9368, the definitions given in ISO 4006 apply.

3.2 Symbols

The symbols used in this part of ISO 9368 are given in table 1.

Table 1 — Symbols

Symbol	Quantity	Dimension[1)]	SI unit
E_R	Random uncertainty, relative value	Dimensionless	—
e_R	Random uncertainty, absolute value	2)	2)
E_S	Systematic uncertainty, relative value	Dimensionless	—
e_S	Systematic uncertainty, absolute value	2)	2)
m	Mass	M	kg
q_V	Volumetric flowrate	$L^3\ T^{-1}$	m^3/s
q_m	Mass flowrate	$M\ T^{-1}$	kg/s
S	Standard deviation, relative value	Dimensionless	—
s	Standard deviation, absolute value	2)	2)
t	Time	T	s
V	Volume	L^3	m^3
ϱ	Liquid density	$M\ L^{-3}$	kg/m^3

1) M = mass; L = length; T = time.

2) The dimensions and units are those of the quantity for which the uncertainty is stated.

4 Certification

If the installation for flowrate measurement by the weighing method is used for purposes of legal metrology, if shall be cer-

1) To be published. (Revision of ISO 4006 : 1977.)