

Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 6: Wedge meters (ISO 5167-6:2022)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 5167-6:2022 sisaldab Euroopa standardi EN ISO 5167-6:2022 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 5167-6:2022 consists of the English text of the European standard EN ISO 5167-6:2022.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 02.11.2022.	Date of Availability of the European standard is 02.11.2022.
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EUROPEAN STANDARD

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Measurement of fluid flow by means of pressure  
differential devices inserted in circular cross-section  
conduits running full - Part 6: Wedge meters (ISO 5167-  
6:2022)

Mesurage de débit des fluides au moyen d'appareils  
déprimogènes insérés dans des conduites en charge de  
section circulaire - Partie 6: Débitmètres à coin (ISO  
5167-6:2022)

Durchflussmessung von Fluiden mit Drosselgeräten in  
voll durchströmten Leitungen mit Kreisquerschnitt -  
Teil 6: Keil-Durchflussmesser (ISO 5167-6:2022)

This European Standard was approved by CEN on 25 September 2022.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

## European foreword

This document (EN ISO 5167-6:2022) has been prepared by Technical Committee ISO/TC 30 "Measurement of fluid flow in closed conduits" in collaboration with CCMC.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2023, and conflicting national standards shall be withdrawn at the latest by May 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 5167-6:2019.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

## Endorsement notice

The text of ISO 5167-6:2022 has been approved by CEN as EN ISO 5167-6:2022 without any modification.

# Contents

Page

Foreword.....	iv
Introduction.....	v
<b>1 Scope.....</b>	<b>1</b>
<b>2 Normative references.....</b>	<b>1</b>
<b>3 Terms and definitions.....</b>	<b>1</b>
<b>4 Principles of the method of measurement and computation.....</b>	<b>2</b>
<b>5 Wedge meters.....</b>	<b>3</b>
5.1 Field of application.....	3
5.2 General shape.....	4
5.3 Material and manufacture.....	5
5.4 Pressure tapings.....	5
5.5 Discharge coefficient, $C$ .....	6
5.5.1 Limits of use.....	6
5.5.2 Discharge coefficient of the wedge meter.....	6
5.6 Expansibility [expansion] factor, $\epsilon$ .....	6
5.7 Uncertainty of the discharge coefficient, $C$ .....	7
5.8 Uncertainty of the expansibility [expansion] factor, $\epsilon$ .....	7
5.9 Pressure loss.....	7
<b>6 Installation requirements.....</b>	<b>7</b>
6.1 General.....	7
6.2 Minimum upstream and downstream straight lengths for installations between various fittings and the wedge meter.....	7
6.3 Additional specific installation requirements for wedge meters.....	8
6.3.1 Circularity and cylindricality of the pipe.....	8
6.3.2 Roughness of the upstream and downstream pipe.....	8
6.3.3 Positioning of a thermowell.....	8
6.3.4 Bidirectional wedge meters.....	9
<b>7 Flow calibration of wedge meters.....</b>	<b>9</b>
7.1 General.....	9
7.2 Test facility.....	9
7.3 Meter installation.....	9
7.4 Design of the test programme.....	9
7.5 Reporting the calibration results.....	10
7.6 Uncertainty analysis of the calibration.....	10
7.6.1 General.....	10
7.6.2 Uncertainty of the test facility.....	10
7.6.3 Uncertainty of the discharge coefficient of the wedge meter.....	10
<b>Annex A (informative) Table of expansibility [expansion] factor.....</b>	<b>11</b>
<b>Annex B (informative) Use of <math>Kd^2</math> parameter.....</b>	<b>12</b>
<b>Bibliography.....</b>	<b>13</b>

## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 30, *Measurement of fluid flow in closed conduits*, Subcommittee SC 2, *Pressure differential devices*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/SS F05, *Measuring instruments*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 5167-6:2019), which has been technically revised.

The main changes are as follows:

- this document is consistent with ISO/IEC Guide 98-3;
- an error in [Annex B](#) has been corrected;
- the expansibility uncertainty is given as a relative uncertainty for ease of use with Part 1 (the calculated flow rate uncertainty is unchanged).

A list of all the parts in the ISO 5167 series can be found on the ISO website.

## Introduction

ISO 5167, consisting of six parts, covers the geometry and method of use (installation and operating conditions) of orifice plates, nozzles, Venturi tubes, cone and wedge meters when they are inserted in a conduit running full to determine the flow rate of the fluid flow in the conduit. It also gives necessary information for calculating the flow rate and its associated uncertainty.

ISO 5167 (all parts) is applicable only to pressure differential devices in which the flow remains subsonic throughout the measuring section and where the fluid can be considered as single-phase, but it is not applicable to the measurement of pulsating flow. Furthermore, each of these devices can only be used within specified limits of pipe size and Reynolds number,  $Re$ .

ISO 5167 (all parts) deals with devices for which direct calibration experiments have been made, sufficient in number, spread and quality to enable coherent systems of application to be based on their results and coefficients to be given with certain predictable limits of uncertainty. However, for wedge meters calibrated in accordance with [Clause 7](#), a wider range of pipe size,  $\beta$  and Reynolds number can be considered.

The devices introduced into the pipe are called primary devices. The term primary device also includes the pressure tappings. All other instruments or devices required to facilitate the instrument readings are known as secondary devices, and the flow computer that receives these readings and performs the algorithms is known as a tertiary device. ISO 5167 (all parts) covers primary devices; secondary devices (see ISO 2186) and tertiary devices will be mentioned only occasionally.

Aspects of safety are not dealt with in ISO 5167-1 to ISO 5167-6. It is the responsibility of the user to ensure that the system meets applicable safety regulations.

# Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full —

## Part 6: Wedge meters

### 1 Scope

This document specifies the geometry and method of use (installation and operating conditions) of wedge meters when they are inserted in a conduit running full to determine the flow rate of the fluid flowing in the conduit.

NOTE 1 As the uncertainty of an uncalibrated wedge meter can be too large for a particular application, it could be deemed essential to calibrate the flow meter according to [Clause 7](#).

This document gives requirements for calibration which, if applied, are for use over the calibrated Reynolds number range. [Clause 7](#) could also be useful guidance for calibration of meters of similar design but which fall outside the scope of this document.

It also provides background information for calculating the flow rate and is applicable in conjunction with the requirements given in ISO 5167-1.

This document is applicable only to wedge meters in which the flow remains subsonic throughout the measuring section and where the fluid can be considered as single-phase. Uncalibrated wedge meters can only be used within specified limits of pipe size, roughness,  $\beta$  (or wedge ratio) and Reynolds number. It is not applicable to the measurement of pulsating flow. It does not cover the use of uncalibrated wedge meters in pipes whose internal diameter is less than 50 mm or more than 600 mm, or where the pipe Reynolds numbers are below  $1 \times 10^4$ .

NOTE 2 A wedge meter has a primary element which consists of a wedge-shaped restriction of a specific geometry. Alternative designs of wedge meters are available; however, at the time of writing there is insufficient data to fully characterize these devices, and therefore these meters are calibrated in accordance with [Clause 7](#).

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 4006, *Measurement of fluid flow in closed conduits — Vocabulary and symbols*

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

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4006, ISO 5167-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>