



NSAI
Standards

Irish Standard
I.S. EN ISO 16911-1:2013

Stationary source emissions - Manual and automatic determination of velocity and volume flow rate in ducts - Part 1: Manual reference method (ISO 16911-1:2013)

I.S. EN ISO 16911-1:2013

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English Version

**Stationary source emissions - Manual and automatic
determination of velocity and volume flow rate in ducts - Part 1:
Manual reference method (ISO 16911-1:2013)**

Émissions de sources fixes - Détermination manuelle et
automatique de la vitesse et du débit-volume d'écoulement
dans les conduits - Partie 1: Méthode de référence
manuelle (ISO 16911-1:2013)

Emissionen aus stationären Quellen - Manuelle und
automatische Bestimmung der Geschwindigkeit und des
Volumenstroms in Abgaskanälen - Teil 1: Manuelles
Referenzverfahren (ISO 16911-1:2013)

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Foreword

This document (EN ISO 16911-1:2013) has been prepared by Technical Committee CEN/TC 264 "Air quality", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 146 "Air quality".

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of an identical text or by endorsement, at the latest by September 2013, and conflicting national standards shall be withdrawn at the latest by September 2013.

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

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INTERNATIONAL
STANDARD

ISO
16911-1

First edition
2013-03-01

**Stationary source emissions — Manual
and automatic determination of velocity
and volume flow rate in ducts —**

Part 1:
Manual reference method

*Émissions de sources fixes — Détermination manuelle et automatique
de la vitesse et du débit-volume d'écoulement dans les conduits —*

Partie 1: Méthode de référence manuelle



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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.

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ISO 16911-1 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee TC 146, *Air quality*, Subcommittee SC 1, *Stationary source emissions*.

ISO 16911 consists of the following parts, under the general title *Stationary source emissions — Manual and automatic determination of velocity and volume flow rate in ducts*:

- *Part 1: Manual reference method*
- *Part 2: Automated measuring systems*

Introduction

EN ISO 16911-1 describes a method for periodic determination of the axial velocity and volume flow rate of gas within emissions ducts and stacks and for the calibration of automated flow monitoring systems permanently installed on a stack.

EN ISO 16911-1 provides a method which uses point measurements of the flow velocity to determine the flow profile and mean and volume flow rates. It also provides for alternative methods based on tracer gas injection, which can also be used to provide routine calibration for automated flow-monitoring systems. A method based on calculation from energy consumption is also described. EN ISO 16911-1 provides guidance on when these alternative methods may be used.

Stationary source emissions — Manual and automatic determination of velocity and volume flow rate in ducts —

Part 1: Manual reference method

1 Scope

EN ISO 16911-1 specifies a method for periodic determination of the axial velocity and volume flow rate of gas within emissions ducts and stacks. It is applicable for use in circular or rectangular ducts with measurement locations meeting the requirements of EN 15259. Minimum and maximum duct sizes are driven by practical considerations of the measurement devices described within EN ISO 16911-1.

EN ISO 16911-1 requires all flow measurements to have demonstrable metrological traceability to national or international primary standards.

To be used as a standard reference method, the user is required to demonstrate that the performance characteristics of the method are equal to or better than the performance criteria defined in EN ISO 16911-1 and that the overall uncertainty of the method, expressed with a level of confidence of 95 %, is determined and reported. The results for each method defined in EN ISO 16911-1 have different uncertainties within a range of 1 % to 10 % at flow velocities of 20 m/s.

Methods further to these can be used provided that the user can demonstrate equivalence, based on the principles of CEN/TS 14793.^[10]

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 20988, *Air quality — Guidelines for estimating measurement uncertainty*

ISO/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

EN 14789, *Stationary source emissions — Determination of volume concentration of oxygen (O₂) — Reference method — Paramagnetism*

EN 14790, *Stationary source emissions — Determination of the water vapour in ducts*

EN 15259:2007, *Air quality — Measurement of stationary source emissions — Requirements for measurement sections and sites and for the measurement objective, plan and report*

3 Terms and definitions

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

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