



# SLOVENSKI STANDARD

## SIST EN 15267-4:2024

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**Kakovost zraka - Ocenjevanje opreme za monitoring kakovosti zraka - 4. del:  
Merila za delovanje in postopki preskušanja prenosnih avtomatskih merilnih  
sistemov (P-AMS) za periodične meritve emisij iz nepremičnih virov**

Air quality - Assessment of air quality monitoring equipment - Part 4: Performance  
criteria and test procedures for portable automated measuring systems for periodic  
measurements of emissions from stationary sources

Luftbeschaffenheit - Beurteilung von Einrichtungen zur Überwachung der  
Luftbeschaffenheit - Teil 4: Mindestanforderungen und Prüfprozeduren für portable  
automatische Messeinrichtungen für wiederkehrende Messungen von Emissionen aus  
stationären Quellen

Qualité de l'air - Évaluation des équipements de surveillance de la qualité de l'air - Partie  
4 : Spécifications de performance et modes opératoires d'essai des systèmes de  
mesurage automatisés portables pour le mesurage périodique des émissions de source

**Ta slovenski standard je istoveten z: EN 15267-4:2023**

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**ICS:**

13.040.99	Drugi standardi v zvezi s kakovostjo zraka	Other standards related to air quality
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EUROPEAN STANDARD

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**Air quality - Assessment of air quality monitoring  
equipment - Part 4: Performance criteria and test  
procedures for portable automated measuring systems for  
periodic measurements of emissions from stationary  
sources**

Qualité de l'air - Évaluation des équipements de surveillance de la qualité de l'air - Partie 4 : Critères de performance et modes opératoires d'essai des systèmes de mesurage automatisés portables pour le mesurage périodique des émissions de sources fixes

Luftbeschaffenheit - Beurteilung von Einrichtungen zur Überwachung der Luftbeschaffenheit - Teil 4: Mindestanforderungen und Prüfprozeduren für portable automatische Messeinrichtungen für wiederkehrende Messungen von Emissionen aus stationären Quellen

This European Standard was approved by CEN on 27 November 2023.

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

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## European foreword

This document (EN 15267-4:2023) has been prepared by Technical Committee CEN/TC 264 “Air quality”, the secretariat of which is held by DIN.

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 June 2024, and conflicting national standards shall be withdrawn at the latest by June 2024.

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 15267-4:2017.

The main changes compared to the previous edition are listed below:

- a) The title of the revised EN 15267 series has been clarified to avoid the impression that all parts deal with the certification of automated measuring systems. The title has been generalized so that specifically Part 1 and Part 2 are also applicable to other air quality monitoring equipment.
- b) The title of revised EN 15267-4 has been clarified to make it clear that Part 4 deals with portable automated measuring systems for periodic measurements of emissions from stationary sources.
- c) The performance criteria and test procedures were adapted to the state of the art in measurement technology.
- d) Requirements for portable automated measuring systems measuring mercury have been added.
- e) References have been updated.

This document is Part 4 of a series of European Standards:

- EN 15267-1, *Air quality — Assessment of air quality monitoring equipment — Part 1: General principles of certification*
- EN 15267-2, *Air quality — Assessment of air quality monitoring equipment — Part 2: Initial assessment of the manufacturer’s quality management system and post certification surveillance for the manufacturing process*
- EN 15267-3, *Air quality — Assessment of air quality monitoring equipment — Part 3: Performance criteria and test procedures for stationary automated measuring systems for continuous monitoring of emissions from stationary sources*
- EN 15267-4, *Air quality — Assessment of air quality monitoring equipment — Part 4: Performance criteria and test procedures for portable automated measuring systems for periodic measurements of emissions from stationary sources*

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

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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

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Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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## Introduction

### 0.1 General

The assessment of air quality monitoring equipment (AQME) supports the requirements of certain Directives of the European Union (EU), which require, either directly or indirectly, that this equipment complies with performance criteria, maximum permissible measurement uncertainties and test requirements. These Directives include the Directive 2010/75/EU on industrial emissions (IED), Directive (EU) 2015/2193 on medium combustion plants and the Directive 2008/50/EC on ambient air quality and cleaner air for Europe.

The assessment of AQME consists of the following sequential stages:

- a) performance testing;
- b) initial assessment of the manufacturer's quality management system (QMS);
- c) certification;
- d) surveillance for the manufacturing process.

This document specifies the performance criteria and test procedures for performance testing of portable automated measuring systems (P-AMS) used for periodic measurements of stationary source emissions. Testing applies to complete measuring systems.

NOTE 1 Portable electrical apparatus designed to measure combustion flue gas parameters of heating appliances are specified in EN 50379-1 to EN 50379-3.

The application of P-AMS for periodic measurements of stationary source emissions is based on:

- specification of the standard reference method (SRM) and validation of the SRM;
- specification of the alternative method (AM) if the P-AMS is based on an AM;
- certification of the P-AMS in accordance with EN 15267-1, EN 15267-2 and EN 15267-4 including demonstration of equivalence with the SRM in the field if the P-AMS is based on an AM;
- on-going quality management by the user of the P-AMS in line with EN ISO/IEC 17025.

NOTE 2 Examples for SRM and RM for different measured components are listed in Annex A.

The overall assessment for the purposes of certification is *conformity testing*, while the evaluation of performance against specified performance criteria is *performance testing*.

### 0.2 Legal drivers

This document supports at least the requirements of the following EU Directives:

- Directive 2010/75/EU on industrial emissions;
- Directive (EU) 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants;
- Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading.

However, this document can also be applied to the monitoring requirements specified in other EU Directives.

**EN 15267-4:2023 (E)****0.3 Periodic measurements**

Certified P-AMS can be used as SRM or AM for periodic measurements of stationary source emissions.

**0.4 Relationship to EN 14181**

Certified P-AMS can be used as SRM or AM for the calibration and validation of stationary AMS for QAL2 and AST purposes.

**0.5 Processes**

Field testing of P-AMS is ordinarily carried out on industrial processes representative of the range of application of the SRM or AM. The premise is that if the P-AMS performs acceptably on these processes, then experience has shown that the P-AMS generally performs well on the majority of other processes. However, there are always exceptions and it is the responsibility of the user to ensure that the P-AMS performs adequately on a specific process.

The necessary field test of P-AMS is specified in this document.

**0.6 Performance characteristics**

A combination of laboratory test and field test is detailed within this document. The laboratory test is designed to assess whether P-AMS can meet, under controlled conditions, the relevant performance criteria. The field test is designed to assess whether P-AMS can continue to work and meet the relevant performance criteria in real applications including transportation to the measurement site, set-up of the P-AMS and measurement.

The main P-AMS performance characteristics are:

- response time;
- repeatability standard deviation;
- lack of fit (linearity);
- short-term drift;
- influence of ambient temperature;
- influence of supply voltage variations;
- influence of vibration;
- influence of sample gas pressure;
- influence of sample gas flow for extractive P-AMS;
- cross-sensitivity to likely interferents contained in the waste gas other than the measured component;
- converter efficiency for P-AMS measuring NO<sub>x</sub>;
- converter efficiency of P-AMS measuring Hg;
- response factors for P-AMS measuring TOC;
- reproducibility;

- trueness and precision of the P-AMS against the SRM under field conditions if the P-AMS is based on an AM.

Additional performance characteristics specific to the SRM or AM are included in the performance test.

The quality assurance and quality control (QA/QC) procedures to be applied by the user of the P-AMS are also assessed in the performance test.

This document is an application and elaboration of EN ISO 9169 with additional and alternative provisions for the performance test of P-AMS. Where this document appears to differ from EN ISO 9169, it either elaborates upon the requirements of EN ISO 9169 or differs in minor ways owing to the necessity to conduct the performance test of P-AMS.

### **0.7 Relationship to EN 15267-3**

This document is based on EN 15267-3, which specifies the performance test of stationary AMS for the continuous monitoring of emissions from stationary sources. Many requirements of this document are identical to those of EN 15267-3. This document deviates from EN 15267-3 only where the portable use and the use as SRM or AM require different or additional requirements. Therefore, this document allows a combined testing according to EN 15267-3 and EN 15267-4 where an AMS is designed for stationary and portable use. It also allows a reduced performance test of P-AMS, which have been already certified according to EN 15267-3 for stationary use.

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## EN 15267-4:2023 (E)

### 1 Scope

This document specifies the general performance criteria and test procedures for the performance test of portable automated measuring systems (P-AMS) used for periodic measurements of stationary source emissions. It applies to the performance test of P-AMS based on measurement techniques specified by the standard reference method (SRM) or an alternative method (AM).

The performance test is based on the general performance criteria and test procedures specified in this document and on the specific requirements specified for the SRM or AM. This includes testing of the applicability and correct implementation of the QA/QC procedures specified for the SRM or AM.

This document supports the requirements of particular EU Directives.

### 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.

EN 14793, *Stationary source emissions - Demonstration of equivalence of an alternative method with a reference method*

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

EN 50160, *Voltage characteristics of electricity supplied by public electricity networks*

EN 60068-2-6, *Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)*

EN 60529, *Degrees of protection provided by enclosures (IP Code)*

EN ISO 14956:2002, *Air quality - Evaluation of the suitability of a measurement procedure by comparison with a required measurement uncertainty (ISO 14956:2002)*

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### 3 Terms and definitions

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

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

#### 3.1

#### air quality monitoring equipment

##### AQME

automated measuring system or data acquisition and handling system

[SOURCE: EN 15267-1:2023, 3.1]

**3.2****automated measuring system****AMS**

entirety of all measuring instruments and additional devices for obtaining a result of measurement

Note 1 to entry: The term “automated measuring system” applies to stationary and portable AMS.

Note 2 to entry: Apart from the actual measuring device (the analyser), a stationary AMS includes facilities for taking samples (e.g. probe, sample gas lines, flow meters and regulator, delivery pump) and for sample conditioning (e.g. dust filter, pre-separator for interferents, cooler, converter). This definition also includes testing and adjusting devices that are required for functional checks and QAL3 procedures and, if applicable, for commissioning.

Note 3 to entry: The term “automated measuring system” (AMS) is typically used in Europe. The terms “continuous emission monitoring system” (CEM) and “continuous ambient-air-quality monitoring system” (CAM) are also typically used in the UK and USA.

[SOURCE: EN 15267-1:2023, 3.2]

**3.3****portable automated measuring system****P-AMS**

automated measuring system which is in a condition or application to be moved from one to another measurement site to obtain measurement results for a short measurement period

Note 1 to entry: The measurement period is typically 8 h for a day.

Note 2 to entry: The P-AMS can be configured at the measurement site for the special application but can be also set-up in a van or mobile container. The probe and the sample gas lines are installed often just before the measurement task is started.

[SOURCE: EN 15267-1:2023, 3.3]

**3.4****reference method****RM**

measurement method taken as a reference by convention, which gives, the accepted reference value of the measurand

Note 1 to entry: A reference method is fully described.

Note 2 to entry: A reference method can be a manual or an automated method.

Note 3 to entry: Alternative methods can be used if equivalence to the reference method has been demonstrated.

[SOURCE: EN 15259:2007, 3.8]

**3.5****standard reference method****SRM**

reference method prescribed by European or national legislation

Note 1 to entry: Standard reference methods are used e.g. to calibrate and validate AMS and for periodic measurements to check compliance with limit values.

[SOURCE: EN 15259:2007, 3.9]

**EN 15267-4:2023 (E)****3.6  
alternative method  
AM**

measurement method which complies with the criteria given by EN 14793 with respect to the reference method

Note 1 to entry: An alternative method can consist of a simplification of the reference method.

Note 2 to entry: Alternative methods can be used if equivalence to the reference method has been demonstrated.

[SOURCE: EN 14793:2017, 3.3, modified – “this European Standard” has been replaced by “EN 14793” and note 2 has been added]

**3.7  
measurement method**

method described in a written procedure containing all the means and procedures required to sample and analyse, namely: field of application, principle and/or reactions, definitions, equipment, procedures, presentation of results, other requirements and measurement report

[SOURCE: EN 14793:2017, 3.4]

**3.8  
measurement**

set of operations having the object of determining a value of a quantity

[SOURCE: EN 15267-3:2023, 3.8]

**3.9  
paired measurement**

simultaneous recording of results of measurement at the same measurement point using two P-AMS of identical design

[SOURCE: EN 15267-3:2023, 3.9]

**3.10  
measurand**

particular quantity subject to measurement

Note 1 to entry: The measurand is a quantifiable property of the waste gas under test, for example mass concentration of a measured component, temperature, velocity, mass flow, oxygen content and water vapour content.

[SOURCE: EN 15259:2007, 3.5]

**3.11  
measured component**

constituent of the waste gas for which a defined measurand is to be determined by measurement

[SOURCE: EN 15259:2007, 3.6]

Note 1 to entry: Measured component is also called determinand.