

SLOVENSKI STANDARD

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**Kakovost zraka - Ocenjevanje opreme za monitoring kakovosti zraka - 3. del:
Merila za delovanje in postopki preskušanja nepremičnih avtomatskih merilnih
sistemov za kontinuirani monitoring emisij iz nepremičnih virov**

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

Luftbeschaffenheit - Beurteilung von Einrichtungen zur Überwachung der
Luftbeschaffenheit - Teil 3: Mindestanforderungen und Prüfprozeduren für stationäre
automatische Messeinrichtungen zur kontinuierlichen Überwachung von Emissionen aus
stationären Quellen

Qualité de l'air - Évaluation des équipements de surveillance de la qualité de l'air - Partie
3: Spécifications de performance et procédures d'essai pour systèmes de mesurage
automatisés fixes de surveillance en continu des émissions de sources fixes

Ta slovenski standard je istoveten z: EN 15267-3:2023

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**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**

Qualité de l'air - Évaluation des équipements de surveillance de la qualité de l'air - Partie 3: Critères de performance et modes opératoires d'essai pour les systèmes de mesure automatisés fixes de surveillance en continu des émissions de sources fixes

Luftbeschaffenheit - Beurteilung von Einrichtungen zur Überwachung der Luftbeschaffenheit - Teil 3: Mindestanforderungen und Prüfprozeduren für stationäre automatische Messeinrichtungen zur kontinuierlichen Überwachung von Emissionen aus stationären Quellen

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

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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

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European foreword

This document (EN 15267-3:2023) 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 15267-3:2007.

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 15267-3 has been clarified to make it clear that Part 3 deals with stationary automated measuring systems for continuous monitoring 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 stationary automated measuring systems measuring mercury have been added.
- e) References have been updated.

This document is Part 3 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 Directive 2010/75/EU on industrial emissions (IED), Directive (EU) 2015/2193 on medium combustion plants and 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 stationary AMS for continuous monitoring of emissions from stationary sources. Testing applies to complete measuring systems.

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.

0.3 Relationship to EN 14181

The quality assurance levels (QAL) defined in EN 14181 cover the suitability of an AMS for its measuring task (QAL1), the regular calibration and validation of the AMS (QAL2), and the control of the AMS during its ongoing operation on an industrial plant (QAL3). An annual surveillance test (AST) is also defined in EN 14181.

This document provides the detailed procedures covering the QAL1 requirements of EN 14181. Furthermore, it provides input data for QAL3.

0.4 Processes

Field testing of an AMS is ordinarily carried out on the most highly demanding industrial process in the range of applications for which a manufacturer seeks certification. The premise is that if the AMS performs acceptably on this process, then experience has shown that the AMS generally performs well on the majority of other processes. However, there are always exceptions and it is the responsibility of

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the manufacturer in conjunction with the user to ensure that the AMS performs adequately on a specific process.

0.5 Performance characteristics

A combination of laboratory test and field test is detailed within this document. The laboratory test is designed to assess whether an AMS can meet, under controlled conditions, the relevant performance criteria. The field test is designed to assess whether an AMS can continue to work and meet the relevant performance criteria in a real application. Field testing is carried out on an industrial process representative of the intended application for the AMS for which the manufacturer seeks certification.

The main AMS performance characteristics are:

- response time;
- repeatability standard deviation;
- lack of fit (linearity);
- 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 AMS;
- cross-sensitivity to likely interferences contained in the waste gas other than the measured component;
- excursion of measurement beam of cross-stack *in situ* AMS; <https://standards.iteh.ai/catalog/standards/sist/d272512a-7d11-4780-b4ea-d8a56e2d43f5/sist-en-15267-3-2024>
- converter efficiency for AMS measuring NO_x;
- converter efficiency for AMS measuring Hg;
- response factors for AMS measuring TOC;
- performance and accuracy of the AMS against the standard reference method (SRM) or alternative method (AM);
- maintenance interval;
- availability;
- reproducibility.

The quality of reference or surrogate materials used under QAL3 for both gaseous measured components and particulate matter measuring AMS is also assessed.

This document is an application and elaboration of EN ISO 9169 with additional and alternative provisions for paired testing. 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 paired testing.

0.6 Relationship to EN 15267-4

This document forms the basis of EN 15267-4, which specifies the performance test of portable automated measuring systems (P-AMS) for periodic measurements of emissions from stationary sources. Many requirements of EN 15267-4 are identical to those of this document. EN 15267-4 deviates from this document 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.

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1 Scope

This document specifies the performance criteria and test procedures for the performance test of stationary automated measuring systems (AMS) that continuously measure gases and particulate matter in, and flow of, the waste gas from stationary sources.

This document supports the requirements of particular EU Directives. It provides the detailed procedures covering the QAL1 requirements of EN 14181 and, where required, input data used in QAL3.

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 13284-1, *Stationary source emissions - Determination of low range mass concentration of dust - Part 1: Manual gravimetric method*

EN 13284-2, *Stationary source emissions - Determination of low range mass concentration of dust - Part 2: Quality assurance of automated measuring systems*

EN 14181:2014, *Stationary source emissions - Quality assurance of automated measuring systems*

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)*

ISO/IEC 60559, *Floating-point arithmetic*

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]

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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

**3.9
paired measurement**

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

**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.

**3.12
interferent**

substance present in the waste gas under investigation, other than the measured component, that affects the output