

Air quality - Certification of automated measuring systems - Part 4: Performance criteria and test procedures for automated measuring systems for periodic measurements of emissions from stationary sources

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 15267-4:2017 sisaldab Euroopa standardi EN 15267-4:2017 ingliskeelset teksti.	This Estonian standard EVS-EN 15267-4:2017 consists of the English text of the European standard EN 15267-4:2017.
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English Version

**Air quality - Certification of automated measuring systems  
- Part 4: Performance criteria and test procedures for  
automated measuring systems for periodic measurements  
of emissions from stationary sources**

Qualité de l'air - Certification des systèmes de  
mesurage automatisés - Partie 4 : Spécifications de  
performance et modes opératoires d'essai des  
systèmes de mesurage automatisés pour le mesurage  
périodique des émissions de sources fixes

Luftbeschaffenheit - Zertifizierung von automatischen  
Messeinrichtungen - Teil 4: Mindestanforderungen und  
Prüfprozeduren für automatische Messeinrichtungen  
für wiederkehrende Messungen von Emissionen aus  
stationären Quellen

This European Standard was approved by CEN on 26 September 2016.

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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

# Contents

Page

European foreword.....	5
<b>0 Introduction.....</b>	<b>6</b>
0.1 General.....	6
0.2 Legal drivers.....	6
0.3 Periodic measurements.....	6
0.4 Relationship to EN 14181.....	6
0.5 Processes.....	7
0.6 Performance characteristics.....	7
0.7 Relationship to EN 15267-3.....	8
<b>1 Scope.....</b>	<b>9</b>
<b>2 Normative references.....</b>	<b>9</b>
<b>3 Terms and definitions.....</b>	<b>9</b>
<b>4 Symbols and abbreviations.....</b>	<b>15</b>
4.1 Symbols.....	15
4.2 Abbreviations.....	17
<b>5 General requirements.....</b>	<b>17</b>
5.1 Application of performance criteria.....	17
5.2 Ranges to be tested.....	17
5.2.1 Certification range.....	17
5.2.2 Supplementary ranges.....	18
5.2.3 Lower limit of ranges.....	18
5.2.4 Expression of performance criteria with respect to ranges.....	18
5.2.5 Ranges of optical insitu P-AMS with variable optical length.....	18
5.3 Performance testing of P-AMS based on certified AMS previously tested according to EN 15267-3.....	18
5.4 Equivalence with the SRM.....	18
5.5 Manufacturing consistency and changes to P-AMS design.....	19
5.6 Qualifications of test laboratories.....	19
<b>6 Performance criteria common to all P-AMS for laboratory testing.....</b>	<b>19</b>
6.1 P-AMS for testing.....	19
6.2 CE labelling.....	19
6.3 Output ranges and zero-point.....	19
6.4 Display of operational status signals.....	20
6.5 Degrees of protection provided by enclosures.....	20
6.6 Response time.....	20
6.7 Repeatability standard deviation at zero point.....	20
6.8 Repeatability standard deviation at span point.....	20
6.9 Lack of fit.....	20
6.10 Short-term zero and span drift.....	20
6.11 Set-up time after transport and influence of ambient temperature.....	20
6.12 Influence of voltage variations.....	21
6.13 Influence of vibration.....	21

6.14	Influence of sample gas flow for extractive P-AMS.....	21
6.15	Influence of sample gas pressure.....	21
6.16	Cross-sensitivity.....	21
6.17	Converter efficiency for P-AMS measuring NO <sub>x</sub> .....	21
6.18	Response factors for TOC measuring P-AMS.....	21
6.19	Influences on P-AMS with in-stack sampling chamber .....	22
6.20	Influences related to storage and transportation.....	22
7	Performance criteria common to all P-AMS for field testing.....	22
7.1	Response time.....	22
7.2	Short-term zero and span drift.....	23
7.3	Reproducibility.....	23
8	Performance criteria specific to measured components .....	23
8.1	General .....	23
8.2	Gas monitoring P-AMS .....	23
8.2.1	Performance criteria.....	23
8.2.2	P-AMS for total organic carbon.....	25
8.3	Particulate matter monitoring P-AMS.....	26
9	General test requirements .....	27
10	Test procedures for laboratory tests.....	28
10.1	P-AMS for testing.....	28
10.2	CE labelling.....	28
10.3	Output ranges and zero point .....	28
10.4	Display of operational status signals.....	29
10.5	Degrees of protection provided by enclosures.....	29
10.6	Response time.....	29
10.7	Repeatability standard deviation at zero point.....	31
10.8	Repeatability standard deviation at span point.....	31
10.9	Lack of fit.....	32
10.10	Short-term zero and span drift.....	33
10.11	Set-up time after transportation and influence of ambient temperature.....	33
10.12	Influence of voltage variations .....	34
10.13	Influence of vibration.....	35
10.14	Influence of sample gas pressure.....	36
10.15	Influence of the sample gas flow for extractive P-AMS .....	36
10.16	Cross-sensitivity.....	37
10.17	Converter efficiency for P-AMS measuring NO <sub>x</sub> .....	38
10.18	Response factors.....	39
10.19	Influences on P-AMS with in-stack sampling chamber .....	40
10.20	Influences related to storage and transportation.....	40
11	Requirements for the field test.....	41
12	Test procedures common to all P-AMS for field tests.....	41
12.1	Response time.....	41
12.2	Short-term zero and span drift.....	41
12.3	Reproducibility.....	42
13	Equivalence with the SRM .....	43
14	Measurement uncertainty .....	43
15	Test report .....	43
	Annex A (normative) Minimum requirements for a test bench.....	44

<b>Annex B (normative) Interferents.....</b>	<b>45</b>
<b>Annex C (normative) Test of linearity .....</b>	<b>46</b>
<b>C.1 Description of the test procedure .....</b>	<b>46</b>
<b>C.2 Establishment of the regression line .....</b>	<b>46</b>
<b>C.3 Calculation of the residuals of the average concentrations.....</b>	<b>47</b>
<b>Annex D (normative) Determination of the total uncertainty .....</b>	<b>48</b>
<b>D.1 Determination of uncertainty contributions .....</b>	<b>48</b>
<b>D.2 Elements required for the uncertainty determinations .....</b>	<b>48</b>
<b>D.3 Example of an uncertainty calculation for a CO measuring P-AMS.....</b>	<b>50</b>
<b>D.4 Determination of uncertainty contributions by use of sensitivity coefficients.....</b>	<b>52</b>
<b>Annex E (informative) Elements of performance testing report.....</b>	<b>53</b>
<b>Annex F (informative) European standard reference methods .....</b>	<b>56</b>
<b>Bibliography.....</b>	<b>57</b>

## European foreword

This document (EN 15267-4:2017) 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 July 2017, and conflicting national standards shall be withdrawn at the latest by July 2017.

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.

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

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

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## 0 Introduction

### 0.1 General

CEN has established standards for the certification of automated measuring systems (AMS) used for monitoring emissions from stationary sources and ambient air quality. This product certification is based on the following four sequential stages:

- a) performance testing of the AMS;
- b) initial assessment of the AMS manufacturer's quality management system;
- c) certification of the AMS;
- d) post certification surveillance.

This European Standard 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 standard reference methods for different measured components are listed in Annex F.

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 European Standard supports the requirements of the following EU Directives:

- Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control)
- Directive 2003/87/EC on processes emitting greenhouse gases.

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

### 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 European Standard.

## 0.6 Performance characteristics

A combination of laboratory and field tests is detailed within this European Standard. Laboratory testing is designed to assess whether a P-AMS can meet, under controlled conditions, the relevant performance criteria. Field testing, is designed to assess whether a 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 voltage variations;
- influence of vibration;
- influence of sample gas pressure;
- influence of sample gas flow for extractive P-AMS;
- cross-sensitivity to likely interferences contained in the stack gas other than the measured component;
- converter efficiency for NO<sub>x</sub> P-AMS;
- response factors for P-AMS measuring TOC;
- reproducibility under field conditions;
- 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 European Standard is an application and elaboration of EN ISO 9169 with additional and alternative provisions for the performance test of P-AMS. Where this European Standard 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 European Standard is based on EN 15267-3, which specifies the performance testing of stationary AMS for the continuous monitoring of emissions from stationary sources. Many requirements of this European Standard are identical to those of EN 15267-3. This European Standard deviates from EN 15267-3 only where the portable use and the use as SRM or AM require different or additional requirements. Therefore, this European Standard allows a combined testing where an AMS is designed for stationary and portable use. It also allows a reduced performance testing of P-AMS, which have been already certified according to EN 15267-3 for stationary use.

## 1 Scope

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

Performance testing is based on the general performance criteria and test procedures specified in this European Standard 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 European Standard supports the requirements of particular EU Directives.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 14793:2017, *Stationary source emissions — Demonstration of equivalence of an alternative method with a reference method*

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

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

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

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

## 3 Terms and definitions

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

### 3.1

#### **automated measuring system**

##### **AMS**

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

Note 1 to entry: Apart from the actual measuring device (the analyser), an 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, if applicable, for commissioning.

Note 2 to entry: The term “automated measuring system” (AMS) is typically used in Europe. The term “continuous emission monitoring system” (CEMS) is also typically used in the UK and USA.