

Stationary source emissions - Quality assurance of automated measuring systems

Stationary source emissions - Quality assurance of automated measuring systems

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 14181:2004 sisaldab Euroopa standardi EN 14181:2004 ingliskeelset teksti.	This Estonian standard EVS-EN 14181:2004 consists of the English text of the European standard EN 14181:2004.
Käesolev dokument on jõustatud 23.09.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.	This document is endorsed on 23.09.2004 with the notification being published in the official publication of the Estonian national standardisation organisation.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

Käsitlusala: This European Standard specifies procedures for establishing quality assurance levels (QAL) for automated measuring systems (AMS) installed on industrial plants for the determination of the flue gas components and other flue gas parameters.	Scope: This European Standard specifies procedures for establishing quality assurance levels (QAL) for automated measuring systems (AMS) installed on industrial plants for the determination of the flue gas components and other flue gas parameters.
---	---

ICS 13.040.40

Võtmesõnad: analysis, chemical analysis and testin, consistency, exhaust, gas analysis, gases, measurement, measuring systems, measuring techniques, pollution control, pollution of the air, quality, quality assurance, specification (approval), specifications, stationary, testing

ICS 13.040.40

English version

Stationary source emissions - Quality assurance of automated measuring systems

Émission des sources fixes - Assurance qualité des systèmes automatiques de mesure

Emissionen aus stationären Quellen - Qualitätssicherung für automatische Messeinrichtungen

This European Standard was approved by CEN on 3 November 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	Page
Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Symbols and abbreviations	9
5 Principle	11
6 Calibration and validation of the AMS (QAL2)	13
7 Ongoing quality assurance during operation (QAL3)	21
8 Annual Surveillance Test (AST)	23
9 Documentation	27
Annex A (normative) QAL2 and AST functional test of AMS	28
Annex B (normative) Test of linearity	32
Annex C (normative) CUSUM Control Charts	34
Annex D (informative) Documentation	40
Annex E (informative) Example of calculation of the calibration function and of the variability test	42
Annex F (informative) Example of calculation of the standard deviation s_{AMS} of the AMS at zero and span level	51
Annex G (informative) Example of using the calibration function and the variability test in the AST	54
Annex H (informative) CUSUM charts field form (drift)	58
Bibliography	59

Foreword

This document (EN 14181:2004) 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 December 2004, and conflicting national standards shall be withdrawn at the latest by December 2004.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association. It supports requirements in the EU Directives 2000/76/EC [1] and 2001/80/EC [2] and may also be applicable for other purposes.

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

Introduction

This standard describes the quality assurance procedures needed to assure that an Automated Measuring System (AMS) installed to measure emissions to air are capable of meeting the uncertainty requirements on measured values given by legislation, e.g. EU Directives [1], [2] or national legislation, and more generally by competent authorities.

Three different Quality Assurance Levels (QAL1, QAL2, and QAL3) are defined to achieve this objective. These Quality Assurance Levels cover the suitability of an AMS for its measuring task (e.g. before or during the purchase period of the AMS), the validation of the AMS following its installation, and the control of the AMS during its ongoing operation on an industrial plant. An Annual Surveillance Test (AST) is also defined.

The suitability evaluation of the AMS and its measuring procedure are described in EN ISO 14956 (QAL1) where a methodology is given for calculating the total uncertainty of AMS measured values. This total uncertainty is calculated from the evaluation of all the uncertainty components arising from its individual performance characteristics that contribute.

1 Scope

This European Standard specifies procedures for establishing quality assurance levels (QAL) for automated measuring systems (AMS) installed on industrial plants for the determination of the flue gas components and other flue gas parameters.

This standard specifies:

- a procedure (QAL2) to calibrate the AMS and determine the variability of the measured values obtained by it, so as to demonstrate the suitability of the AMS for its application, following its installation;
- a procedure (QAL3) to maintain and demonstrate the required quality of the measurement results during the normal operation of an AMS, by checking that the zero and span characteristics are consistent with those determined during QAL1;
- a procedure for the annual surveillance tests (AST) of the AMS in order to evaluate (i) that it functions correctly and its performance remains valid and (ii) that its calibration function and variability remain as previously determined.

This standard is designed to be used after the AMS has been accepted according to the procedures specified in EN ISO 14956 (QAL1).

This standard is restricted to quality assurance (QA) of the AMS, and does not include the QA of the data collection and recording system of the plant.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories* (ISO/IEC 17025:1999).

3 Terms and definitions

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

3.1

air quality characteristic

one of the quantifiable properties relating to an air mass under investigation, for example, concentration of a constituent

[ISO 6879:1995]

3.2

automated measuring system AMS

measuring system permanently installed on site for continuous monitoring of emissions

NOTE 1 An AMS is a method which is traceable to a reference method.