
**Stationary source emissions —
Determination of carbon monoxide, carbon
dioxide and oxygen — Performance
characteristics and calibration of automated
measuring systems**

*Émissions de sources fixes — Détermination de la concentration de
monoxyde de carbone, de dioxyde de carbone et d'oxygène —
Caractéristiques de fonctionnement et étalonnage de systèmes
automatiques de mesure*



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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 3.

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12039 was prepared by Technical Committee ISO/TC 146, *Air quality*, Subcommittee SC 1, *Stationary source emissions*.

Annex A forms a normative part of this International Standard.

Introduction

Carbon dioxide, carbon monoxide and oxygen are gases found in the exhaust gases of combustion processes. Determination of the concentration of these gases may assist the operator in the optimization of the combustion process. The determination of O_2 and CO_2 is also necessary to normalize the measured concentration of other gases and dusts to defined conditions. There are a number of ways to measure concentrations of CO_2 , CO and O_2 in ducts. This International Standard describes methods and equipment for the measurement of concentrations of these gases.

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Stationary source emissions — Determination of carbon monoxide, carbon dioxide and oxygen — Performance characteristics and calibration of automated measuring systems

1 Scope

This International Standard specifies the principles, the essential performance characteristics and the calibration of automated systems for measuring carbon dioxide, carbon monoxide and oxygen in the flues of stationary sources.

This International Standard specifies extractive and non-extractive systems in connection with several types of instrumental analyser. The following techniques have provided the basis for practical instrumentation:

- paramagnetism (O_2);
- magnetic wind (O_2);
- differential pressure (Quinke) (O_2);
- magnetodynamics;
- zirconium oxide (O_2);
- electrochemical cell (O_2 and CO);
- infrared absorption (CO and CO_2).

Other equivalent instrumental methods may be used provided they meet the minimum requirements proposed in this International Standard.

The measuring system may be calibrated with certified gases, in accordance with this International Standard, or comparable methods.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 6145-2:—¹⁾, *Gas analysis — Preparation of calibration gas mixtures using dynamic volumetric methods — Part 2: Volumetric pumps*

ISO 6879:1995, *Air quality — Performance characteristics and related concepts for air quality measuring methods*

ISO 10396:1993, *Stationary source emissions — Sampling for the automated determination of gas concentrations*

ISO 10849, *Stationary source emissions — Determination of the mass concentration of nitrogen oxides — Performance characteristics of automated measuring systems*

1) To be published.