BS EN IEC 61207-3:2019

BSI Standards Publication

Gas Analyzers — Expression of performance

Part 3: Paramagnetic oxygen analysers

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National foreword

This British Standard is the UK implementation of EN IEC 61207-3:2019. It is identical to IEC 61207-3:2019. It supersedes BS EN 61207-3:2002, which will be withdrawn on 31 July 2022.

The UK participation in its preparation was entrusted to Technical Committee GEL/65/2, Elements of systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Published by BSI Standards Limited 2019

ISBN 978 0 580 85543 6

ICS 71.040.40; 19.040

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2019.

Amendments/corrigenda issued since publication

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61207-3

August 2019

ICS 19.040; 71.040.40

Supersedes EN 61207-3:2002 and all of its amendments and corrigenda (if any)

English Version

Gas Analyzers - Expression of performance - Part 3: Paramagnetic oxygen analysers (IEC 61207-3:2019)

Analyseurs de gaz - Expression des performances - Partie 3: Analyseurs d'oxygène paramagnétiques (IEC 61207-3:2019)

Angabe zum Betriebsverhalten von Gasanalysatoren - Teil 3: Paramagnetische Sauerstoffanalysatoren (IEC 61207-3:2019)

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European foreword

The text of document 65B/1155/FDIS, future edition 3 of IEC 61207-3, prepared by SC 65B "Measurement and control devices" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61207-3:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-04-30
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-07-31

This document supersedes EN 61207-3:2002 and all of its amendments and corrigenda (if any).

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61115	NOTE	Harmonized as EN 61115
IEC 60654-1	NOTE	Harmonized as EN 60654-1
ISO 9001	NOTE	Harmonized as EN ISO 9001

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 61207-1	-	Expression of performance of gas analyzers - Part 1: General	EN 61207-1	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

GAS ANALYZERS – EXPRESSION OF PERFORMANCE –

Part 3: Paramagnetic oxygen analyzers

FOREWORD

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International Standard IEC 61207-3 has been prepared by sub-committee 65B: Measurement and control devices, of IEC technical committee 65: Industrial-process measurement, control and automation.

This third edition cancels and replaces the second edition published in 2002. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) all references (normative and informative) have been updated, deleted or added to as appropriate;
b) all the terms, descriptions and definitions relating to the document have been updated where appropriate;

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c) all references to “errors” have been replaced by “uncertainties” and appropriate updated definitions applied.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
65B/1155/FDIS	65B/1157/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

This International Standard is to be used in conjunction with IEC 61207-1:2010.

A list of all parts in the IEC 61207 series, published under the general title *Gas analyzers – Expression of performance*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

Paramagnetic oxygen analyzers respond to the partial pressure of oxygen in the measured gas, and the volumetric concentration is then determined by knowledge of the total pressure, as in many other gas analyzers. Due to this fact, many paramagnetic oxygen analyzers use pressure compensation (see 4.4.4 and 4.4.5). They are used in a wide range of industrial, laboratory, medical, and other applications where the rated measuring range of the analyzer is between 0 % to 1 % and 0 % to 100 %, at reference pressure (usually near atmospheric).

Only a few gases display significant paramagnetism (for example, oxygen, nitric oxide and nitrogen dioxide), and oxygen has the strongest paramagnetic susceptibility (see Annex A) among gases. By employing this particular property of oxygen, analyzers have been designed that can be highly specific to the measurement in most industrial and medical applications, where, for example, high background levels of hydrocarbons or moisture may be present.

There are several different techniques described for measuring oxygen by its paramagnetic property, but three main methods have evolved over many years of commercial application.

The three methods are:

– automatic null balance;
– thermomagnetic or magnetic wind;
– differential pressure or Quincke.

These methods all require the sample gas to be clean and non-condensing, though some versions work at elevated temperatures so that samples that are likely to condense at a lower temperature can be analyzed. Because of this requirement, analyzers often require a sample system to condition the sample prior to measurement.

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