Irish Standard
I.S. EN 61207-1:2010

Expression of performance of gas analyzers -- Part 1: General (IEC 61207 -1:2010 (EQV))

I.S. EN 61207-1:2010

Incorporating amendments/corrigenda issued since publication:

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I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

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SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

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English version

Expression of performance of gas analyzers - Part 1: General

(IEC 61207-1:2010)

Expression des performances des analyseurs de gaz - Partie 1: Généralités (CEI 61207-1:2010)

Angabe zum Betriebsverhalten von Gasanalysatoren - Teil 1: Allgemeines (IEC 61207-1:2010)

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Ref. No. EN 61207-1:2010 E

Foreword

The text of document 65B/741/FDIS, future edition 2 of IEC 61207-1, prepared by SC 65B, Devices & process analysis, of IEC TC 65, Industrial-process measurement, control and automation, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61207-1 on 2010-07-01.

This European Standard supersedes EN 61207-1:1994.

The significant technical changes with respect to EN 61207-1:1994 are the following:

– All references (normative and informative) have been updated, deleted or added, as appropriate.

– All the terms and definitions relating to this International Standard have been updated.

– All references to “errors” have been replaced by “uncertainties” and appropriate updated definitions applied.

– Where only one value is quoted for a performance specification, such as intrinsic uncertainty, linearity uncertainty or repeatability throughout a measurement range, this has now been defined as the maximum value, rather than an average or “representative” value. This was previously undefined.

– Where zero and 100 % span calibration gases are used, there is now a defined requirement that the analyser must be able to respond within its standard performance specifications beyond its normal measurement range, to allow for any under or over response of the instrument to be recorded.

– A new Annex A has been added giving recommended standard values of influence.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2011-04-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2013-07-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61207-1:2010 was approved by CENELEC as a European Standard without any modification.

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

IEC 61207-2	NOTE	Harmonized as EN 61207-2.
IEC 61298 series	NOTE	Harmonized in EN 61298 series (not modified).
IEC 61326 series	NOTE	Harmonized in EN 61326 series (not modified).
ISO 6141	NOTE	Harmonized as EN ISO 6141.
ISO 6142	NOTE	Harmonized as EN ISO 6142.
ISO 6143	NOTE	Harmonized as EN ISO 6143.
ISO 6144	NOTE	Harmonized as EN ISO 6144.
ISO 9001	NOTE	Harmonized as EN ISO 9001
ISO 16664	NOTE	Harmonized as EN ISO 16664.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60068	Series	Environmental testing	EN 60068	Series
IEC 60359	2001	Electrical and electronic measurement equipment - Expression of performance	EN 60359	2002
IEC 60381-1	-	Analogue signals for process control systems - Part 1: Direct current signals	HD 452.1	-
IEC 60382	-	Analogue pneumatic signal for process control systems	EN 60382	-
IEC 60654	Series	Industrial-process measurement and control equipment - Operating conditions -	EN 60654	Series
IEC 60654-1	-	Industrial-process measurement and control equipment - Operating conditions - Part 1: Climatic conditions	EN 60654-1	-
IEC 60770	Series	Transmitters for use in industrial-process control systems	EN 60770	Series
IEC 60770-1	-	Transmitters for use in industrial-process control systems - Part 1: Methods for performance evaluation	EN 60770-1	-
IEC 61010-1	-	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements	EN 61010-1	-
IEC 61187	-	Electrical and electronic measuring equipment - Documentation	EN 61187	-
ISO 31-0	-	Quantities and units - Part 0: General principles	-	-
ISO 1000	-	SI units and recommendations for the use of their multiples and of certain other units	-	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

EXPRESSION OF PERFORMANCE OF GAS ANALYZERS –

Part 1: General

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61207-1 has been prepared by subcommittee 65B: Devices and process analysis, of IEC technical committee 65: Industrial-process measurement, control and automation.

This second edition cancels and replaces the first edition published in 1994 and constitutes a technical revision.

The significant technical changes with respect to the first edition are the following:

a) All references (normative and informative) have been updated, deleted or added, as appropriate.
b) All the terms and definitions relating to this International Standard have been updated.
c) All references to "errors" have been replaced by "uncertainties" and appropriate updated definitions applied.
d) Where only one value is quoted for a performance specification, such as intrinsic uncertainty, linearity uncertainty or repeatability throughout a measurement range, this

has now been defined as the maximum value, rather than an average or “representative” value. This was previously undefined.

e) Where zero and 100 % span calibration gases are used, there is now a defined requirement that the analyser must be able to respond within its standard performance specifications beyond its normal measurement range, to allow for any under or over response of the instrument to be recorded.

f) A new Annex A has been added giving recommended standard values of influence.

The text of this standard is based on the following documents:

FDIS	Report on voting
65B/741/FDIS	65B/752/RVD

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

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

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

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

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

EXPRESSION OF PERFORMANCE OF GAS ANALYZERS –

Part 1: General

1 Scope and object

This part of IEC 61207 is applicable to gas analyzers used for the determination of certain constituents in gaseous mixtures.

This part of IEC 61207 specifies the terminology, definitions, requirements for statements by manufacturers and tests that are common to all gas analyzers. Other international standards in this series, for example IEC 61207-2, describe those aspects that are specific to certain types (utilizing high-temperature electrochemical sensors).

This part IEC 61207 is in accordance with the general principles set out in IEC 60359 and IEC 60770.

This standard is applicable to analyzers specified for permanent installation in any location (indoors or outdoors) and to such analyzers utilizing either a sample handling system or an *in situ* measurement technique.

This standard is applicable to the complete analyzer when supplied by one manufacturer as an integral unit, comprised of all mechanical, electrical and electronic portions. It also applies to sensor units alone and electronic units alone when supplied separately or by different manufacturers.

For the purposes of this standard, any regulator for mains-supplied power or any non-mains power supply, provided with the analyzer or specified by the manufacturer, is considered part of the analyzer whether it is integral with the analyzer or housed separately.

Safety requirements are dealt with in IEC 61010-1.

If one or more components in the sample is flammable, and air or another gas mixture containing oxygen or other oxidizing component is present, then the concentration range of the reactive components are limited to levels which are not within flammability limits.

Standard range of analogue d.c. current and pneumatic signals used in process control systems are dealt with in IEC 60381-1 and IEC 60382.

Specifications for values for the testing of influence quantities can be found in IEC 60654.

Requirements for documentation to be supplied with instruments are dealt with in IEC 61187.

Requirements for general principles concerning quantities, units and symbols are dealt with in ISO 1000. See also ISO 31-0.

This part of IEC 61207 does not apply to:

– accessories such as recorders, analogue-to-digital converters or data acquisition systems used in conjunction with the analyzer, except that when two or more such analyzers are combined and sold as a subsystem and a single electronic unit is supplied to provide continuous measurement of several properties, that read-out unit is considered to be part of the analyzer. Similarly, e.m.f-to-current or e.m.f-to-pressure converters which are an integral part of the analyzer are included.

The object of this part of IEC 61207 is:

– to specify the general aspects in the terminology and definitions related to the performance of gas analyzers used for the continuous measurement of gas composition;
– to unify methods used in making and verifying statements on the functional performance of such analyzers;
– to specify which tests should be performed in order to determine the functional performance and how such tests should be carried out;
– to provide basic documents to support the application of standards of quality assurance within ISO 9001.

2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 60068 (all parts), *Environmental testing*

IEC 60359:2001, *Electrical and electronic measurement equipment – Expression of performance*

IEC 60381-1, *Analogue signals for process control systems – Part 1: Direct current signals*

IEC 60382, *Analogue pneumatic signal for process control systems*

IEC 60654 (all parts), *Industrial-process measurement and control equipment – Operating conditions*

IEC 60654-1, *Industrial-process measurement and control equipment – Operating conditions – Part 1: Climatic conditions*

IEC 60770 (all parts), *Transmitters for use in industrial-process control systems*

IEC 60770-1, *Transmitters for use in industrial-process control systems – Part 1: Methods for performance evaluation*

IEC 61010-1, *Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements*

IEC 61187, *Electrical and electronic measurement equipment – Documentation*

ISO 31-0, *Quantities and units – General principles*

ISO 1000, *SI units and recommendations for the use of their multiples and of certain other units*

3 Terms and definitions

3.1 General

For the purposes of this document, the following terms and definitions apply. The definitions in 3.2 (excepting 3.2.17), 3.3 and 3.4 are taken from IEC 60359.