



NSAI
Standards

Irish Standard
I.S. EN 50104:2019

Electrical equipment for the detection and measurement of oxygen - Performance requirements and test methods

I.S. EN 50104:2019

Incorporating amendments/corrigenda/National Annexes 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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This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

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National Foreword

I.S. EN 50104:2019 is the adopted Irish version of the European Document EN 50104:2019, Electrical equipment for the detection and measurement of oxygen - Performance requirements and test methods

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EUROPEAN STANDARD

EN 50104

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2019

ICS 13.320

Supersedes EN 50104:2010 and all of its amendments
and corrigenda (if any)

English Version

Electrical equipment for the detection and measurement of oxygen - Performance requirements and test methods

Appareils électriques de détection et de mesure de
l'oxygène - Exigences d'aptitude à la fonction et méthodes
d'essai

Elektrische Geräte für die Detektion und Messung von
Sauerstoff - Anforderungen an das Betriebsverhalten und
Prüfverfahren

This European Standard was approved by CENELEC on 2019-08-26. CENELEC 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 CEN-CENELEC Management Centre or to any CENELEC 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 CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN 50104:2019 (E)

Contents	Page
European foreword.....	4
4.1 Introduction	12
4.2 Design.....	12
4.2.1 General	12
4.2.2 Indicating devices	12
4.2.3 Alarm signals.....	13
4.2.4 Fault signals	14
4.2.5 Adjustments.....	14
4.2.6 Battery-powered equipment.....	15
4.2.7 Gas detection transmitter for use with separate gas detection control units	15
4.2.8 Separate gas detection control units for use with gas detection transmitter(s).....	15
4.2.9 Equipment using software and/or digital technologies	15
4.3 Labelling and marking.....	15
4.4 Instruction manual	15
5.1 Introduction	18
5.2 General requirements for tests.....	18
5.2.1 Samples and sequence of tests.....	18
5.2.2 Preparation of equipment before testing.....	19
5.2.3 Mask for calibration and test	20
5.3 Normal conditions for test	20
5.3.1 General	20
5.3.2 Test gas(es)	20
5.3.3 Flow rate for test gases.....	20
5.3.4 Power supply	21
5.3.5 Temperature	21
5.3.6 Pressure.....	21
5.3.7 Humidity	21
5.3.8 Acclimation time	21
5.3.9 Orientation.....	21
5.3.10 Communications options	21
5.3.11 Gas detection equipment as part of systems	21
5.4 Test methods and performance requirements	22
5.4.1 General	22
5.4.2 Unpowered storage.....	22
5.4.3 Calibration curve and repeatability	23
5.4.4 Stability	23
5.4.5 Alarm set-point(s)	24
5.4.6 Temperature.....	24
5.4.7 Pressure.....	25
5.4.8 Humidity	25
5.4.9 Air velocity.....	26
5.4.10 Flow rate	26
5.4.11 Orientation.....	26

5.4.12	Vibration	27
5.4.13	Drop test.....	28
5.4.14	Warm-up time	29
5.4.15	Time of response	29
5.4.16	Battery capacity	29
5.4.17	Power supply variations	30
5.4.18	Electromagnetic compatibility	30
5.4.19	Addition of sampling probe.....	30
5.4.20	Poisons and other gases.....	31
5.4.21	Field calibration kit.....	31
5.4.22	Operation at or below the lower limit of the measuring range	31
5.4.23	Verification of software and digital components	32
Annex A (informative)	Significant changes between this edition and EN 50104:2010	33
Annex ZZ (informative)	Relationship between this European standard and the essential requirements of Directive 2014/34/EU aimed to be covered	36
Table ZZ.1 —	Correspondence between this European standard and Annex II of Directive 2014/34/EU	36
Bibliography	37

EN 50104:2019 (E)

European foreword

This document (EN 50104:2019) has been prepared by CLC/TC 31, “*Electrical apparatus for potentially explosive atmospheres*”.

The following dates are fixed:

- latest date by which this document has (dop) 2020-08-26
to be implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2022-08-26
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have to be withdrawn

This document supersedes EN 50104:2010 and all of its amendments and corrigenda (if any).

The State of the Art is included in Annex A “Significant changes between this edition and EN 50104:2010” which lists all changes to EN 50104:2010.

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

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EU Directive 2014/34/EU.

For the relationship with EU Directive(s), see informative Annex ZZ, which is an integral part of this document.

1 Scope

This document specifies general requirements for design, testing and performance, and describes the test methods that apply to portable, transportable and fixed equipment for the measurement of the oxygen concentration in gas mixtures indicating up to 25 % (v/v). The equipment, or parts thereof, may be intended for use in explosive atmospheres (see 4.1) and in mines susceptible to firedamp.

This document applies to equipment intended for monitoring oxygen deficiency and enrichment.

EXAMPLE Monitoring oxygen deficiency and/or enrichment includes:

- protection of human health and safety in potentially oxygen deficient atmospheres;
- fire protection by monitoring areas with reduced oxygen concentration;
- fire protection by monitoring oxygen concentrations exceeding that of normal ambient air.

This document also applies to equipment with an oxygen measuring function for explosion protection in the case of monitoring inertisation.

NOTE 1 Inertisation is an explosion protection technique where a potentially explosive atmosphere is purged with inert gas.

NOTE 2 Commonly used oxygen sensors in commercial equipment for industrial application are:

- electrochemical sensors (aqueous and solid electrolytes);
- paramagnetic sensors;
- zirconium dioxide sensors;
- tunable diode laser absorption spectroscopy sensors (TDLAS).

This document is applicable to equipment intended to measure reliably the oxygen concentration, to provide an indication, alarm or other output function, the purpose of which is to give a warning of a potential hazard and, in some cases, to initiate automatic or manual protective action(s), whenever the level exceeds or falls below an alarm set point.

This document is applicable to equipment, including integral sampling systems of aspirated equipment, intended to be used for commercial, industrial and non-residential safety applications.

This document does not apply to external sampling systems, or to equipment of laboratory or scientific type, or to medical equipment, or to equipment used only for process monitoring and/or control purposes. For equipment used for sensing the presence of multiple gases, this document applies only to the measurement of oxygen.

This document is also applicable to equipment using optical principles (e.g. TDLAS), where the optical transmitter and receiver or the optical transceiver (i.e. combined transmitter and receiver) and a suitable reflector are not located in a common enclosure. However, in this case it will be necessary to modify the test conditions described in Clause 5.3 and to introduce supplementary tests to Clause 5.4 of this document. Such supplementary tests will include alignment, beam block fault, long range operation. Guidance to appropriate modification of the test conditions and supplementary tests can be taken from EN 60079-29-4. Modifications of the test conditions as well as modified and supplementary tests are expected to be agreed between the manufacturer and test laboratory and identified and described in the test report.

2 Normative references

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.

EN 50270, *Electromagnetic compatibility - Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen*

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