

**BRITISH STANDARD**

# **Electronic portable and transportable apparatus designed to detect and measure carbon dioxide in indoor ambient air – Requirements and test methods**

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## Summary of pages

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# Foreword

## Publishing information

This British Standard is published by BSI and came into effect on 31 July 2007. It was prepared by Subcommittee GEL/31/19, *Gas detectors*, under the authority of Technical Committee GEL/31, *Equipment for explosive atmospheres*. A list of organizations represented on this committee can be obtained on request to its secretary.

## Information about this document

This is a new standard, which has been written to fill a need for the standardization of electronic portable apparatus designed to detect and measure carbon dioxide.

## Hazard warnings

**WARNING.** This British Standard calls for the use of substances and/or procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

## Use of this document

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

## Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

## Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard cannot confer immunity from legal obligations.**

# 1 Scope

This British Standard specifies requirements for the construction, testing and performance of electronic portable and transportable apparatus for the detection and measurement of carbon dioxide (CO<sub>2</sub>) in indoor ambient air, which includes air entering mechanical ventilation systems in dwellings, commercial premises and industrial premises. This standard covers equipment to indicate up to typically 20 000 ppm (2%) CO<sub>2</sub> in air.

*NOTE 1 The CO<sub>2</sub> measuring capabilities of indoor air quality apparatus are covered by this standard.*

*NOTE 2 The measurement capabilities of electronic portable and transportable apparatus that are additional to the measurement of CO<sub>2</sub> are not covered in this standard. Other standards that cover these additional measurement capabilities include BS EN 50379 for electronic portable combustion gas analysers and BS EN 45544 for toxic gas detection apparatus having an alarm function for alerting an operator to an unsafe workplace atmosphere.*

# 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.

BS 4884-1, *Technical manuals – Part 1: Specification for presentation of essential information*

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

BS EN 60079-0:2004, *Electrical apparatus for explosive gas atmospheres – Part 0: General requirements*

BS EN 60335-1:2002, *Household and similar electrical appliances – Safety – Part 1: General requirements*

BS EN 60529, *Degrees of protection provided by enclosures (IP code)*

# 3 Terms and definitions

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

## 3.1 ambient air

normal atmosphere surrounding the apparatus

*NOTE The concentration of CO<sub>2</sub> in ambient air is typically different from the concentration in outdoor air.*

## 3.2 aspirated apparatus

gas detection apparatus that obtains the gas by drawing it through a sample line to the gas sensor, for example, by means of a hand-operated or electric pump

[BS EN 61779-1:2000, 2.2.2]

**3.3 battery-powered**

apparatus designed to be energized from batteries alone, whether disposable or rechargeable

**3.4 calibration**

process of determining the deviation of a measuring apparatus relative to a standard and subsequent adjustment, if necessary, to achieve the manufacturer's stated specification

**3.5 clean air**

air that contains CO<sub>2</sub> at outdoor air concentrations but is free of other gases and vapours to which the sensing element is sensitive or which influence the performance of the sensing element

**3.6 diffusion apparatus**

apparatus in which the transfer of gas from the atmosphere to the gas sensor takes place by random molecular movement, i.e. under conditions in which there is no aspirated flow

[BS EN 61779-1:2000, 2.2.4]

**3.7 dwellings**

unit of residential accommodation including residential park homes, flats, bed-sits, maisonettes, terraced, semi-detached and detached houses (including all such residential accommodation situated within or forming part of commercial or industrial or agricultural premises), leisure accommodation and boats, excluding vessels with an international load line certificate

*NOTE It is recognized that the guidance can be applied to premises other than dwellings, such as those supplying a small number of clients on a bed and breakfast basis.*

[BS 7967-1:2005, 3.1]

**3.8 electronic portable combustion gas analyser**

electronic apparatus that will detect and measure the presence of combustion gases and clearly display the result

[BS 7967-1:2005, 3.4]

**3.9 gas concentration**

amount of CO<sub>2</sub> present expressed as parts per million or percent by volume

*NOTE Parts per million (ppm) measurements can be expressed as parts per million (volume) (ppm<sub>v</sub>).*

**3.10 indoor air quality apparatus**

apparatus used to determine the health and comfort of the air inside buildings, often used for analysing the efficiency of air filtration and ventilation systems

*NOTE The apparatus can be designed to measure a number of different factors, such as gaseous composition, temperature, relative humidity and airborne contaminant levels.*

**3.11 portable apparatus**

apparatus that has been designed to be carried readily from place to place and to be used while it is being carried