

Method of

# Expression of performance of air quality infra-red analysers

[IEC title: Expression of performance of air quality infra-red  
analyzers]

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- Ministry of Defence\*
- Post Office\*
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The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

- British Industrial Measuring and Control Apparatus Manufacturers' Association
- Department of Industry (British Calibration Service)
- Department of Industry (National Physical Laboratory)
- Individual experts

This British Standard, having been prepared under the direction of the Electronic Equipment Standards Committee, was published under the authority of the Executive Board and comes into effect on 31 January 1980

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# Contents

|                                                                     | Page               |
|---------------------------------------------------------------------|--------------------|
| Cooperating organizations                                           | Inside front cover |
| National foreword                                                   | ii                 |
| 1 General                                                           | 1                  |
| 1.1 Scope                                                           | 1                  |
| 1.2 Object                                                          | 1                  |
| 2 Definitions                                                       | 1                  |
| 2.1 Non-dispersive infra-red analyzer                               | 1                  |
| 2.2 Calibration gas                                                 | 1                  |
| 2.3 Performance characteristic                                      | 2                  |
| 2.4 Influence quantity                                              | 2                  |
| 2.5 Values related to quantities                                    | 2                  |
| 2.6 Terms related to the specification of performance               | 2                  |
| 2.7 Terms related to conditions of operation, transport and storage | 4                  |
| 3 Procedure for statement                                           | 4                  |
| 4 Recommended standard values and ranges of influence quantities    | 6                  |
| 4.1 Climatic conditions                                             | 6                  |
| 4.2 Mechanical conditions                                           | 8                  |
| 4.3 Mains supply conditions                                         | 9                  |
| 5 Verification of values                                            | 9                  |
| Index of definitions                                                | 13                 |
| Publications referred to                                            | Inside back cover  |

# National foreword

This British Standard, published under the direction of the Electronic Equipment Standards Committee, is identical with IEC Publication 528 “Expression of performance of air quality infra-red analyzers” published in 1975 by the International Electrotechnical Commission (IEC).

**Terminology and conventions.** The text of the International Standard has been approved as suitable for publication, without deviation, as a British Standard. Some terminology and certain conventions are not identical with those used in British Standards.

In British Standards it is current practice to use the spelling “analysers” for “analyzers”.

### Scope

Clause 1 (General) of the International Standard is not presented in the way that is customary for the scope clause of a British Standard. Clause 1 should be read as the following, which makes no change in the technical meaning and is essentially a re-arrangement of the existing text.

“This standard specifies the terminology and definitions related to the functional performance of non-dispersive infra-red analysers used for the continuous determination of certain aspects of air quality by measuring gaseous constituents either in ambient or confined atmospheres or in gaseous streams entering the ambient air; it unifies the methods used in making and verifying statements on the functional performance of such analysers; and it specifies what tests should be performed to determine the functional performance and how such tests should be carried out.

It is applicable to infra-red analysers for installation either indoors or outdoors. It is applicable to the complete analyser as an integral analytical unit, including all optical, mechanical, electrical and electronic portions and, for the purpose of this standard, any regulated power supply provided with the analyser or specified by the manufacturer is considered part of the analyser, whether it is integral with the analyser or housed separately.

This standard does not apply to the required sample-handling systems or other accessories such as recorders, analogue-to-digital converters or data acquisition systems used in conjunction with the analyser.

Safety requirements are specified in IEC Publication 348, “Safety requirements for electronic measuring apparatus”.

This standard is in accordance with the general principles set out in IEC Publication 359, “Expression of the functional performance of electronic measuring equipment”.

### Cross-references

| International Standard <sup>a</sup> | Corresponding British Standard                                                                                          |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| IEC 348:1978                        | BS 4743:1979 <i>Safety requirements for electronic measuring apparatus</i><br>(Identical)                               |
| IEC 359:1971                        | BS 4889:1973 <i>Method for specifying the performance of electronic measuring equipment</i><br>(Technically equivalent) |
| IEC 381:1971                        | BS 3586:1970 <i>Analogue direct current signals for telemetry and control</i><br>(Related)                              |

<sup>a</sup> Undated in the text.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**

### Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 14, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.



## 1 General

### 1.1 Scope

**1.1.1** This standard applies to non-dispersive infra-red analyzers used for the continuous determination of certain aspects of air quality by measuring gaseous constituents either in ambient or confined atmospheres or in gaseous streams entering the ambient air.

**1.1.2** It applies to infra-red analyzers specified for installation either indoors or outdoors.

**1.1.3** It applies to the complete analyzer as an integral analytical unit, including all optical, mechanical, electrical and electronic portions.

For the purpose of this standard, any regulated 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.

**1.1.4** It does not apply to the required sample handling systems or other accessories such as recorders, analogue-to-digital converters or data acquisition systems, used in conjunction with the analyzer.

**1.1.5** Safety requirements are dealt with in IEC Publication 348, Safety Requirements for Electronic Measuring Apparatus.

**1.1.6** This standard is in accordance with the general principles set out in IEC Publication 359, Expression of the Functional Performance of Electronic Measuring Equipment.

### 1.2 Object

This standard is intended:

- to specify the terminology and definitions related to the functional performance of non-dispersive infra-red analyzers used for the continuous determination of certain aspects of air quality by measuring gaseous constituents either in ambient or confined atmospheres or in gaseous streams entering the ambient air;
- to unify methods used in making and verifying statements on the functional performance of such analyzers;
- to specify what tests should be performed to determine the functional performance and how such tests should be carried out.

## 2 Definitions

The following definitions apply for the purpose of this standard:

### 2.1

#### **non-dispersive infra-red analyzer**

an electro-optical spectrophotometric instrument with no spectral dispersion component, consisting of a single or double source of infra-red radiation and one or more infra-red detectors separated by an optical cell or cells through one or more of which the sample flows, whereby the specific spectral absorption of the component of interest is determined

NOTE 1 For the purpose of this standard, the analyzer is adjusted by the manufacturer to select only the spectral band(s) at which the component to be determined has its characteristic absorption, and the sample cell length is appropriate for the rated range of concentration.

NOTE 2 Specific spectral sensitivity is obtained by a selective component such as a selective source, selective detector or selective filter, or any combination of these components.

### 2.2

#### **calibration gas**

a mixture of known concentration of the component to be determined or a suitable simulant for the component to be determined in air or another suitable carrier gas, used for periodic calibration of the infra-red analyzer, and for various performance tests

NOTE 1 For the purpose of this standard, concentration means the mass or the volume of the component to be determined in a given volume of calibration gas. Different units may be used, but the manufacturer shall state exactly what is meant.