



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS B 7951 : 2004
(JEMIMA/JSA)

**Continuous analyzer for carbon
monoxide in ambient air**

ICS 13.040.20; 71.040.40

Reference number : JIS B7951 : 2004 (E)

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee, as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Electric Measuring Instruments Manufacturers' Association (JEMIMA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS B 7951:1998** is replaced with this Standard. Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

Date of Establishment: 1974-09-01

Date of Revision: 2004-03-20

Date of Public Notice in Official Gazette: 2004-03-22

Investigated by: Japanese Industrial Standards Committee
Standards Board

Technical Committee on Testing and
Measurement Technology

JIS B 7951 :2004, First English edition published in 2005-01

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

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Printed in Japan

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Contents

	Page
1 Scope	1
2 Normative references	1
3 Definitions	1
4 Type and range of measuring apparatus	2
5 Performance	2
6 Construction	3
6.1 Construction in general	3
6.2 Measuring apparatus	3
6.3 Indicator recorder	8
7 Performance test	8
7.1 General matters	8
7.2 Test condition	8
7.3 Testing methods	10
8 Test report	12
9 Marking	12
10 Instruction manual	12
Annex (informative) Controlled potential electrolysis-type continuous analyzer for carbon monoxide	14

Continuous analyzer for carbon monoxide in ambient air

1 Scope This Japanese Industrial Standard specifies the automatic measuring apparatus of the infrared absorption type for continuously measuring concentration of carbon monoxide in ambient air (hereafter referred to as “measuring apparatus”).

Information : The measuring apparatus by the measurement type other than this type is shown in annex (informative).

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS C 1302 *Insulation resistance testers*

JIS K 0002 *Reference material — Standard gas — Carbon monoxide*

JIS K 0003 *Reference material — Standard gas — Carbon dioxide*

JIS K 0055 *General rules for calibration method of gas analyzer*

JIS K 0151 *Non-dispersive infrared gas analyzer*

JIS K 0211 *Technical terms for analytical chemistry (General part)*

JIS K 0212 *Technical terms for analytical chemistry (optical part)*

JIS K 0213 *Technical terms for analytical chemistry (Electrochemistry division)*

JIS K 0215 *Technical terms for analytical chemistry (analytical instrument part)*

JIS Z 8103 *Glossary of terms used in measurement*

3 Definitions For the purposes of this Standard, the definitions given in **JIS K 0211**, **JIS K 0212**, **JIS K 0213**, **JIS K 0215** and **JIS Z 8103** and the following definitions apply:

- a) **sample air** ambient air to be introduced into the measuring apparatus in order to measure the concentration of carbon monoxide
- b) **sample gas** the gas obtained by removing dusts contained in the sampled air with a dust filter
- c) **zero gas** the gas used for calibration of the minimum scale value on the measuring apparatus
- d) **span gas** the gas used for calibration of the maximum scale value on the measuring apparatus
- e) **zero drift** the fluctuation of indicated value corresponding to the minimum scale of the measuring apparatus during definite interval
- f) **span drift** the fluctuation of indicated value to the scale span of the measuring apparatus during definite interval
- g) **established flow rate** the flow rate of sampled air, calibration gas, etc. specified in the measuring apparatus

- h) **converter** the device which converts carbon monoxide in sample gas into carbon dioxide
- i) **ppm** the volume ratio of concentration expressed by parts per million

4 Type and range of measuring apparatus The type and range of measuring apparatus shall be as given in table 1.

In addition, the range shall be suitably chosen from the ranges given in table 1.

Table 1 Type and range of measuring apparatus

Type	Range ⁽¹⁾ ppm	Substance to be measured	Applicable condition
Infrared absorption type	0 to 5 through 0 to 100	Carbon monoxide	None in particular

Note ⁽¹⁾ The appropriately divided range according to the purpose in this range is provided.

5 Performance The measuring apparatus shall conform to the performance given in table 2 when its performance test is carried out according to clause 7.

Table 2 Performance

Item	Performance	Test method
Repeatability	± 2 % of the maximum scale value	7.3 a)
Zero drift	± 2 % of the maximum scale value	7.3 b)
Span drift	± 2 % of the maximum scale value	7.3 c)
Error of indication	± 4 % of the maximum scale value	7.3 d)
Minimum detection limit	Not more than 1 % of the maximum scale value	7.3 e)
Response time	2 min and 30 s max.	7.3 f)
Effects of interfering components	± 5 % of the maximum scale value Provided that if the range of 0 ppm to 5 ppm is adopted, it shall be not more than 0.3 ppm.	7.3 g)
Stability of indicated value to variation in sample gas flow rate	± 2 % of the maximum scale value	7.3 h)
Stability to voltage fluctuation	± 1 % of the maximum scale value	7.3 i)
Withstand voltage	No abnormalities shall occur.	7.3 j)
Insulation resistance	5 M Ω min.	7.3 k)

6 Construction

6.1 Construction in general The construction of measuring apparatus shall meet the following requirements:

- Its shape is correct, and its structure and finish of each part are superior and solid.
- Its ordinary operation never brings about any danger, and it works safely and smoothly.
- Each part does not easily cause mechanical or electric trouble, and is constructed so as to avoid any danger.
- It is constructed so as not to give an impediment while the measuring apparatus is being operated, due to dew condensation or the like.
- The parts where heat will be produced by a light source or heater are constructed not to bring about the deformation or functional deterioration due to thermal action.
- It shall be constructed in such a way that it is easily checked or maintained without any danger.

6.2 Measuring apparatus

6.2.1 Constitution of measuring apparatus The measuring apparatus consists of a sampling part, an infrared gas analyzer, etc. as shown in figure 1.

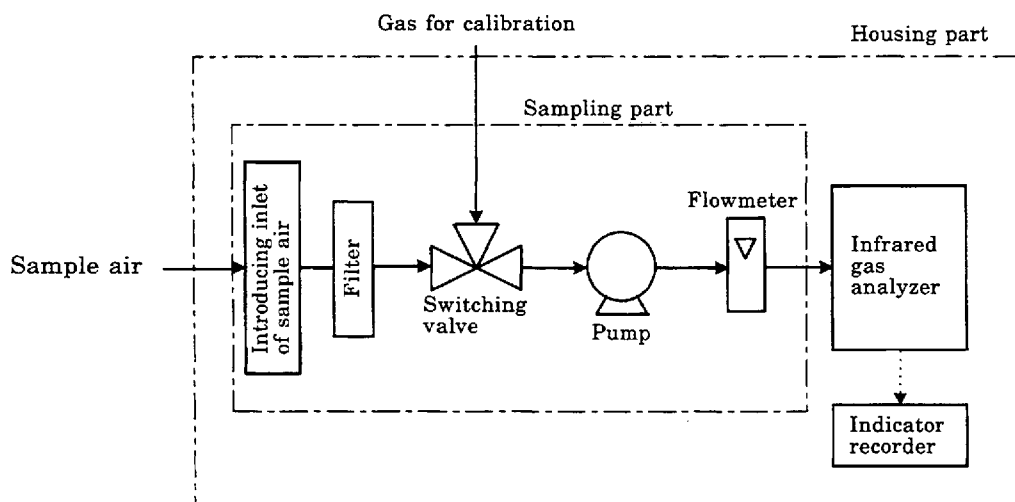


Figure 1 Example of construction of measuring apparatus

- Sampling part** This part is for removing dust contained in the sampled air, and for providing a definite amount of sample gas to the analyzer.
 - Introducing inlet of sampled air** The part connecting the introducing pipe of sampled air, which measures about 4 mm to 8 mm inside diameter.
 - Filter** Filter paper made of glass fibre, cellulose fibre, or synthetic resin, is used.
 - Pump** It is the pump for inhaling the sampled air, and normally a diaphragm pump is used.