

JIS

JAPANESE INDUSTRIAL STANDARD

**Methods for determination
of carbon dioxide in air**

JIS K 0304—1996

Translated and Published

by

Japanese Standards Association

**In the event of any doubt arising,
the original Standard in Japanese is to be final authority**

Errata for JIS (English edition) are printed in *Standardization Journal*, published monthly by the Japanese Standards Association.

Errata will be provided upon request, please contact:

**Business Department,
Japanese Standards Association**
4-1-24, Akasaka, Minato-ku,
Tokyo, JAPAN 107
TEL. 03-3583-8002
FAX. 03-3583-0462

Errata are also provided to subscribers of JIS (English edition) in *Monthly Information*.

JAPANESE INDUSTRIAL STANDARD

J I S

Methods for determination of
carbon dioxide in air

K 0304-1996

1. Scope This Japanese Industrial Standard specifies the highly accurate measuring method of concentration of carbon dioxide in air.

Remarks 1. The standards cited in this Standard are listed in Attached Table 1.

2. The units and numerical values given in { } in this Standard are based on the traditional units and are appended for informative reference.

2. Matters in common The general matters commonly adopted in this Standard shall follow JIS K 0055, JIS K 0114, JIS K 0151, JIS K 0211, JIS K 0213, and JIS Z 8103.

3. Definitions For the purposes of this Standard, the definitions given in JIS K 0042 and the following definitions apply.

- (1) direct sampling method Method to directly sample air into a sample container which has been previously made vacuum.
- (2) sampling method by gas displacement Method to sample by displacing inside of sample container with air.
- (3) carbon-dioxide mixing gas Mixing gas of carbon dioxide and air.
- (4) differential-type infrared gas analyzer With construction by which comparison gas can be flowed through the comparison cell of a non-dispersive infrared gas analyzer specified in JIS K 0151.

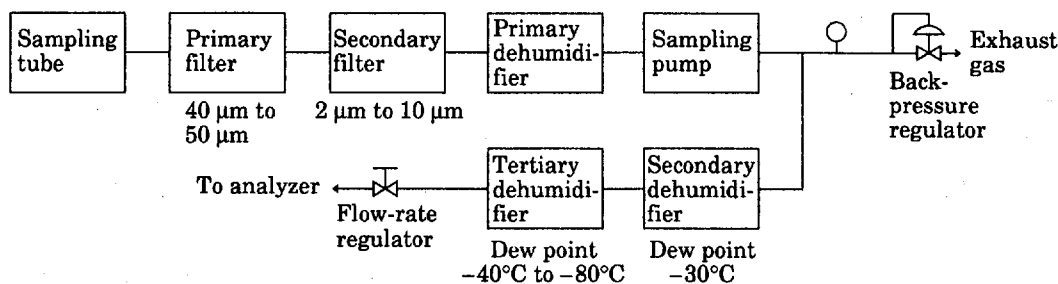
4. Type of measuring methods Measuring methods shall be classified into two types as non-dispersive infrared gas analysis and gas chromatography.

5. Sampling method of sample gas

5.1 Case of continuous sampling

5.1.1 Construction of apparatus As shown in Fig. 1, the apparatus shall be composed of sampling tube, primary filter, secondary filter, primary dehumidifier, sampling pump, back-pressure regulator, secondary dehumidifier, tertiary dehumidifier, and flow-rate regulator.

Fig. 1. Sampling apparatus of sample gas (an example)

(1) Sampling tube Sampling tube shall be as follows.

- (a) The sampling tube shall be constructed in consideration of the flow rate of sample gas, mechanical strength, and easiness of cleaning.
- (b) Shape the end of sampling tube not to introduce dust or rainwater.
- (c) Place filtering material in suitable location of the sampling tube to keep the sample gas from mingling dust and so on.

(2) Introducing pipe Introducing pipe shall be as follows.

- (a) Decide the inside diameter of an introducing pipe in consideration of the length of introducing pipe, quantity of gas sucked in, clogging by condensed water, capacity of sampling pump, and so on.
- (b) Carry out heat insulation or heating of the introducing pipe to avoid condensing of humidity kept in sample gas in the pipe, or to avoid freezing of condensed water in the pipe.
- (c) Choose the material of introducing pipe which has little permeation of air or displacement by air.

Informative reference: Such as stainless steel, or lamination of aluminum alloy and polyethylene can be used for introducing pipe.

(3) Filter Install a filter at suitable position between a sampling pipe and primary dehumidifier in order to keep sample gas from mingling of dust and mist.

Remarks: Use primary filter with pore size of around 40 μm to 50 μm , and secondary filter with around 2 μm to 10 μm , both of which is made of stainless steel.

(4) Primary dehumidifier

- (a) Dehumidifier It dehumidifies the gas up until the humidity in sample gas does not condense, and is either electronically cooling type or semipermeable membrane type specified in 4.9 of JIS K 0095.