

SPECIFICATIONS



Item	Specitication
Measuring items	1) Gas volume/internal gas pressure of carbonated beverages 2) Air content and its oxygen concentration of carbonated beverages 3) Inside gas pressure of non-carbonated beverages
Measuring range	1) Pressure: 0.010 to 0.500 MPaG 2) Temperature: 0 to 50 °C 3) Residual gas volume: 0 to 30 mL (Amount of residual gas after absorption of alkaline aqueous solution) 4) Oxygen concentration: 0 to 21 vol% (optional) (If the residual gas volume is less than 8 mL, measurement is not possible)
Accuracy	1) Pressure: ±0.001 MPa 2) Temperature: ±0.05 °C 3) Residual gas volume: ±2% of the measured value (in case that the volume is 5 mL or more but less than 30 mL) ±0.1 mL of the measured value (in case that the volume is 0 mL or more but less than 5 mL) (When measuring the standard gas specified by our company) 4) Oxygen concentration: ±0.2 vol% (optional)
Calibration	1) Gas volume section Pressure sensor Calibration with a calibration pressure gauge Zero calibration 0.000 MPaG Span calibration 0.500 MPaG 2) Gas volume section Temperature sensor Calibration with standard thermometer Offset adjustment approximately 20 °C 3) Air content section Pressure sensor Calibration with a calibration pressure gauge Zero calibration 0.000 MPaG Span calibration 0.050 MPaG 4) Oxygen sensor Calibration by atmosphere and nitrogen gas Zero calibration 0.00 % Span calibration 20.9 %
Measurement time	Gas volume/internal gas pressure: Approx. 90 seconds for one sample Residual gas volume: 5 to 12 minutes for one sample *It depends on samples and conditions
Sample container	PET bottle: ~2.0 L (160 mL cans, various PET containers) 1) For lightweight containers 2) Compatible with tamper-resistant cap (double-layered lid) 3) Maximum volume of container: φ110 x 315 mm (height)

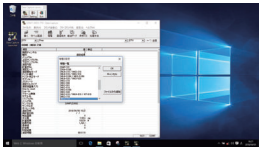
Item	Specitication
Display	16-digit x 1-line LCD display (with backlight)
Stored data	500 latest measurement results 20 methods
Results obtained by calculation	1) Gas volume from pressure and temperature 2) Residual gas volume after absorption into alkaline aqueous solution 3) Air content from residual gas volume and oxygen concentration 4) Inside gas pressure of non-carbonated beverages
External output	1) RS-232C 1ch for connection to a printer or external computer 2) USB port 1ch for data transfer or barcode reader
Ambient condition	1) Temperature: 5 to 35 °C (41 to 95 °F) 2) Humidity: 85 %RH or below (no condensation)
Power supply	AC 100 to 240 V ±10 % 50 Hz / 60 Hz
Power consumption	40 W
Coating	Alkali-resistant coating
External dimensions	495(W) x 555(D) x 570(H) mm (19.5 (W) x 21.8 (D) x 22.4 (H) inches)
Weight	Approx. 38 kg (84 lbs)
Required air pressure	0.6 to 0.7 MPaG
Option	1) Dot Matrix Printer IDP-100 2) Oxygen Concentration Measurement Unit 3) Data Acquisition Software SOFT-CAP



1) Dot matrix printer



2) Oxygen concentration measurement unit



3) SOFT-CAP

Gas Volume / Air content Analyzer

GVA-710



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KEM KYOTO ELECTRONICS  
MANUFACTURING CO.,LTD.  
<https://www.kem.kyoto>

Overseas Division : 2-7-1, Ichigaya-sadohara-cho, Shinjuku-ku  
TOKYO, 162-0842, JAPAN  
Fax : +81-3-3268-5591 Phone : +81-3-5227-3156

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# SUMMARY / FEATURES

## Summary

By simply setting a sample container on the sample stage, the following operations are performed automatically; opening, sniffing, continuous shaking, the injection of the sample gas into the absorbent cylinder filled with alkaline solution, and the dissolution of the carbon dioxide gas in the absorbent cylinder.

By continuously rotating a sample container, the gas volume / internal gas pressure is calculated from the equilibrium pressure of the sample container and the sample temperature.

Furthermore, after absorbing the carbon dioxide gas in the absorbent cylinder, the amount of gas (residual gas) except for carbon dioxide is measured by the plunger pump and air content is calculated by measurement of oxygen concentration by the optional oxygen sensor.

Data printing is available by connecting an external printer. Output to a PC is also available.



## Features

### Time reduction

Reduces pre-treatment and post-treatment time by 30% and air volume measurement time by 70% compared to conventional instrument.

### Various rinse mode

Multiple rinsing modes are available for each measurement mode. Convenient functions such as post-treatment and cleaning at the same time are provided.

### Method

Total of 20 methods can be set in an instrument.

### Accuracy

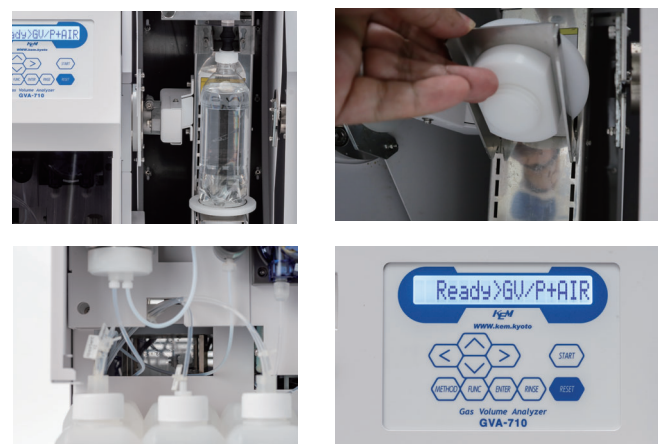
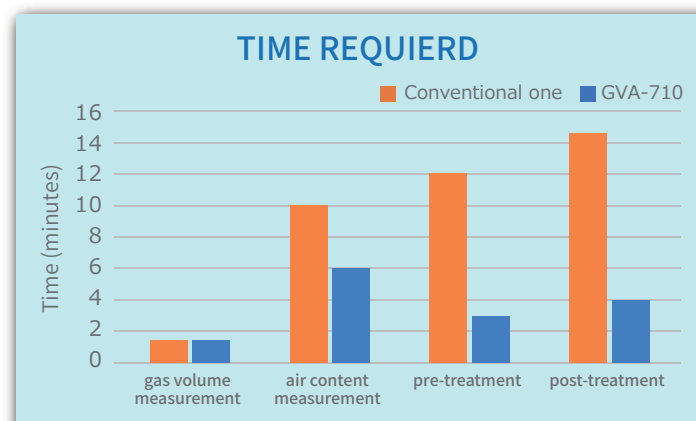
A plunger pump is adopted to improve the air content measurement method. Even low-volume air content can be measured more accurately than ever before.

### Data management

Up to 500 measurement data stored in the main unit can be saved in the USB memory. The method can be created on the personal computer and imported into the instrument.

### Barcode reader

By connecting a commercially available barcode reader, sample information can be easily transferred to the instrument, and sample information and measurement results can be associated and managed.



# MEASUREMENT PRINCIPLE

## Gas volume

Calculate the gas volume from the conversion formula using the measured values of temperature and equilibrium pressure. Selectable two types of conversion tables are programmed in the instrument, one for soft drinks and the other for beer, which can be switched by operators.

## Air content

The amount of residual gas is calculated by a formula from the discharge amount and pressure of the plunger pump. In addition, the oxygen concentration of the gas is measured, and it is converted into air content.

$$\text{AIR} = V \times C / 20.9$$

AIR: air content V: residual gas volume C: oxygen concentration

## Internal gas pressure

From the obtained gas volume and conversion formula, calculate the balance pressure when the sample temperature is 20 °C.

## Inside gas pressure

Internal gas pressure of the sample at 20 °C is calculated by the measured gas volume and conversion formula.

$$\text{PRESS} = \frac{20 + 273.15}{\text{Temp} + 273.15} \times \text{Press}$$

Press: measured pressure Temp: sample temperature  
PRESS: equivalent pressure at 20°C (converted)

## Measurement flow

※ Measurement of gas Volume and air content

- 1 Measure the volume of the gas existing inside the absorbent cylinder.
- 2 Pierce the nozzle into the container.
- 3 Inject the gas inside the container to the absorbent cylinder.
- 4 Shake the container until equilibrium.
- 5 Measure the sample temperature and the equilibrium pressure.
- 6 Inject the gas inside the container to the absorbent cylinder.
- 7 Absorb the carbon dioxide in the absorbent cylinder.
- 8 Measure the volume of the gas remaining inside the absorbent cylinder.
- 9 Relieve the pressure in the absorbent cylinder.
- 10 Measure the oxygen concentration of the remaining gas inside the absorbent cylinder.
- 11 Refill the absorbent solution inside the absorbent cylinder.
- 12 Pull the nozzle out of the container.

