

# CGP-31

**Handheld Carbon Dioxide Meter**

**CO<sub>2</sub> Measurement  
in Gas or Liquid Phase Samples**



**Wide Range**  
(0.1 to 100%)

**Power Saving Design**  
(2000 hours continuous  
measurement  
with two AA batteries)

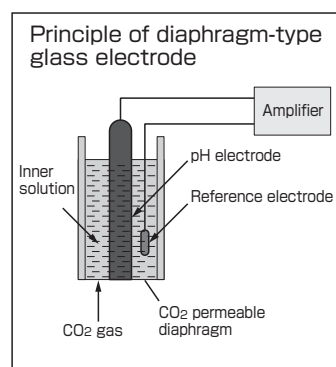
**Installation  
Sample**



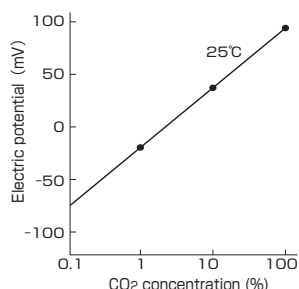
# CGP-31 Handheld Carbon Dioxide Meter

## Measurement principle

A diaphragm-type glass electrode based on the electrochemical principle is employed for this CO<sub>2</sub> gas sensor. According to this principle, when CO<sub>2</sub> gas passes through the diaphragm and dissolves in the inner solution, the pH of the solution changes. Because the change of the pH is proportional to the CO<sub>2</sub> concentration, the degree of change is measured to determine the CO<sub>2</sub> concentration. The following figure indicates the relationship, which exhibits good linearity characteristics, between the CO<sub>2</sub> concentration and the electric potential of the glass electrode. If there is a 10-fold change in the CO<sub>2</sub> concentration, there is an approximately 60 mV change in the electric potential.



Relationship between the CO<sub>2</sub> concentration and the electric potential difference of the glass electrode



## Features

### ■Excellent selectivity

The diaphragm-type glass electrode method is employed to guard against the effects of other mixed gases (except acid gases and basic gases). There is also no need for drying sample because the sensor is relatively unaffected by humidity.

### ■Concentration conversion function

You can specify to switch between the gas phase concentration (%(v/v)) and the liquid phase concentration (mg/L).

### ■Memory function capable of saving up to 1,000 data items

Supports auto-save for specified intervals\*

\*Short interval memory function: 1 sec. to 99 min. 59 sec.

Long interval memory function: 2 min. to 99 hrs. 59 min.

(When using the long interval memory function, the switch turns off (enters sleep mode) after measuring concentration for 1 minute. It remains off until the next measurement starts.)

### ■Interface for external devices

(Ability to connect the meter to a personal computer, an external printer, and a recorder.)

We also provide special data acquisition software for loading saved measurement data into a personal computer in text format.

## Specifications

|                                      |  |   |
|--------------------------------------|--|---|
| Measurement method                   | Diaphragm-type glass electrode method  |   |
| Measurement range                    | CO <sub>2</sub>  | Liquid phase : 1.49 to 1490 mg/L<br>Gas phase : 0.1 to 100%   |
|                                      | Temperature  | 5.0 to 50.0°C   |
| Display range                        | CO <sub>2</sub>  | Liquid phase : 0.000 to 2.020 mg/L, 0.00 to 20.20 mg/L, 0.0 to 202.0 mg/L, 0 to 2020 mg/L<br>Gas phase : 0.000 to 0.202%, 0.00 to 2.02%, 0.0 to 20.2%, 0 to 202%<br>Range selection : Automatic/ Manual |
|                                      | Temperature  | -5.0 to 110.0°C   |
| Repeatability                        | CO <sub>2</sub>  | ±5% FS or less<br>(Measurement conducted using standard solutions)  |
|                                      | Temperature  | ±0.5°C or less  |
| Response time                        | 90% response : Approx. 2 min.<br>(Measurement conducted using standard solutions)  |   |
| Calibration method                   | Two-point calibration using a standard CO <sub>2</sub> solutions or standard gases   |   |
| External output ports*               | • RS-232C (non-isolated) : Personal computer or external printer EPS-P30 (optional)<br>• Analog output (non-isolated) : Three output ports for concentration, temperature, and range |   |
| Waterproof construction (meter part) | IP 67 (enabled when the sensor is connected and on the external I/O ports are masked)<br>* The meter part can be submerged at a depth of 1 m for up to 30 min.                       |   |
| Ambient temperature/humidity         | 0 to 45 °C, no more than 90% (no condensation)   |   |
| Power source                         | Two AA alkaline batteries/ nickel hydrogen batteries<br>Dedicated AC adapter (6 VA, optional) also available   |   |
| Power consumption                    | Approximately 0.003 W (when using batteries)   |   |
| External dimensions                  | Meter part : Approx. 68 mm (W)×35 mm (H)×173 mm (L)  |   |
| Weight                               | Meter part : Approx. 280 g (includes batteries)  |   |

\*Special cable is required to use the RS-232C interface and the analog output port simultaneously. Please contact us for details.

If the sample is grounded, make sure to insulate the RS-232C and analog output port.

Note 1) A DKK-TOA stirrer or commercially available stirrer would be needed to use standard solutions for calibrations.

Note 2) The lower (sensing) part of the sensor probe has been designed for immersion into a liquid samples. However, the upper part, around where the cable entry is located, is not suitable for immersion into liquid samples. Therefore the sensor probe should not be completely immersed into liquid samples.

## Standard accessories

|  |                                       |
|--|---------------------------------------|
| CO <sub>2</sub> electrode ELX-008(cable length : 1m)<br>(Only included when full set is ordered) | Protection cover (with shoulder belt) |
| Calibration cell CGC-202L(3 pcs)   | Electrode stand                       |
| Powder of CO <sub>2</sub> calibration solution : 143D044   | Electrode holder                      |
| Ion strength adjuster: 143D045   | AA alkaline battery (trial use) (2)   |
|  | Instruction manual                    |

## Optional parts

| Product                                  | Model / Code No. |
|--|------------------|
| Stirrer                                  | ST-7             |
| External printer (with connection cable) | EPS-P30          |
| Analog output cable (1.5 m)              | 118N063          |
| Data acquisition software                | GP-LOG           |
| RS-232C connection cable (2 m)           | 118N062          |
| AC adapter                               | —                |



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**CAUTION**

Please read the operation manual carefully before using products.

Specifications and prices are subject to change without notice.

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