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CO₂ MONITORING MODULES

Metal oxide semiconductor type CO₂ sensor: SB-AQ6A
CO₂ and cigarette smoke sensor: SB-AQ6B

For air quality control, ventilation system, and environmental monitoring

Features

• Most suitable for indoor air quality control and ventilation system monitoring CO₂ in the range between 400 ppm to 3000 ppm.

• Semiconductor type CO₂ sensor's cost is very low compared with an optical type.

• No maintenance and long life

Applications

• Indoor air quality controls

• Ventilation for home and industrial purposes

• CO₂ monitoring in living rooms

Two sensor models; Only CO₂ or CO₂ + cigarette smoke. Two output modules; 0 to 1V and 0 to 5V. You can select the best combination for your purpose.

FIS is the first company in the world to have succeeded in commercializing CO₂ (Carbon dioxide) sensors using metal oxide semiconductors (Awarded for "Technical Achievements" by the Chemical Society of Japan). Doping Lanthanum into tin-dioxide has realized a large increase in CO₂ sensitivity. Two types of CO₂ sensors are prepared: "SB-AQ6A" for only CO₂ detection, and "SB-AQ6B" for CO₂ and cigarette smoke detection (Hydrogen is used as a typical content in smoke.). With these sensors, it is possible to monitor CO₂ concentration in the ambient atmosphere. Gas sensitive semiconductor material is a mini bead type, a heater coil and electrode wire are embedded in the element. This sensor can be operated with just 35mW power consumption (Fig. 1). The sensing element is installed in the metal housing with three pins. This sensor unit is placed in an external filter housing removing the effect of noise gases and wind (Fig. 2). Fig.3 shows the gas sensitivity of SB-AQ6A and SB-AQ6B. "Automatic base level renewal method" is implemented in the software which changes from the sensor output signal to CO₂ concentration.
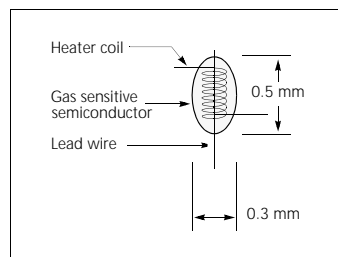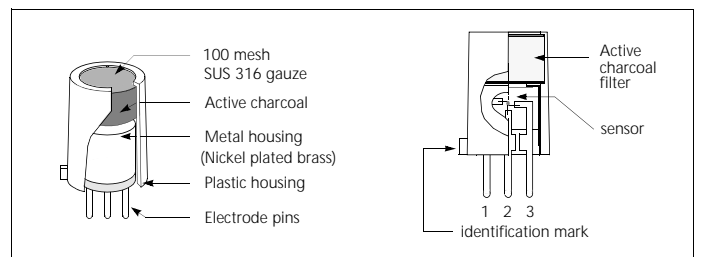

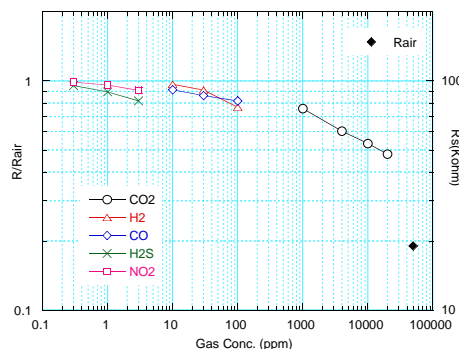Fig 1. Sensing element

Fig 2. Configuration

Fig 3. Cross sensitivity (SB-AQ6A)
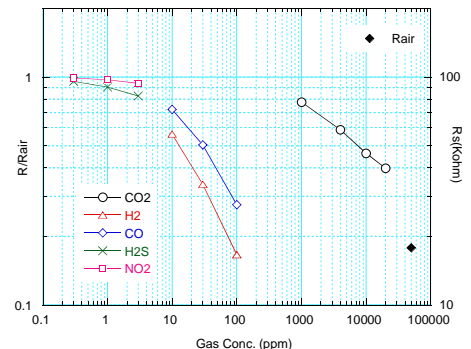
Fig 3. Cross sensitivity (SB-AQ6B)

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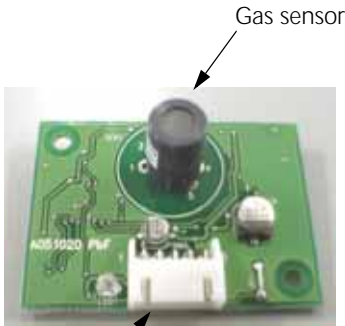
Products Range of CO_2 monitoring modules

Basic specifications

• Power supply:	5V DC ± 5%
• Initial warm-up time:	2 minutes 30 seconds
• Sensor:	SB-AQ6A (for CO_2) or SB-AQ6B (for CO_2 and cigarette smoke)
• Analogue output:	0 to 1V or 0 to 5V (attached connector: B5B-XH-A by JST)
• Alarm output:	MOS output, 5V DC output at ON, 20 second delay, auto-reset
• Alarm concentration:	1600ppm of CO_2, 3ppm of H2
• Power consumption:	Lower than 200mW (35mW for sensor) (NOTE: The current may reach 1A immediately after power-on)
• Operating temperature:	0ºC to 40ºC
• Storage temperature:	-10ºC to 60ºC
• Size:	51(W) x 37(D) x 20(H) mm
• Weight:	10 g

Note: Only the module is available.

Model	Features	Applications
A051020-AQ6A-01	• Sensor: SB-AQ6A • Analogue output: 0 to 1V • Alarm conc: 1600ppm of CO_2	Gas sensor I/O connector
A051020-AQ6A-02	• Sensor: SB-AQ6A • Analogue output: 0 to 5V • Alarm conc: 1600ppm of CO_2	
A051020-AQ6B-01	• Sensor: SB-AQ6B • Analogue output: 0 to 1V • Alarm conc: 1600ppm of CO_2 and 3ppm of H2	
A051020-AQ6B-02	• Sensor: SB-AQ6B • Analogue output: 0 to 5V • Alarm conc: 1600ppm of CO_2 and 3ppm of H2	

I/O connector specifications
Pin No.
1: GND for power supply
2: +5V DC for power supply
3: Analogue output
4: GND for analogue output
5: Alarm output

* Analogue output
corresponds to the
concentration of CO_2 only.

Operation procedure
1. Connect 5V DC to pins 1 and 2.
2. LED starts blinking which indicates warm-up period. Wait 2 minutes 30 seconds until LED turns off.
3. Measure analogue output from pins 3 and 4 to convert CO_2 concentration.
4. Disconnect power supply from the module when the measurement is finished.
* When the concentration exceeds the alarm level, LED blinks and the alarm output turns ON. When the concentration decreases and becomes lower than the alarm level, LED turns off and the alarm output turns OFF.
* The relationship between analogue output and CO_2 concentration is as below:
  0 to 1V output model: ppm of CO_2 = (mV x 5) + 400
  0 to 5V output model: ppm of CO_2 = mV + 400

Example of monitoring CO_2 in a meeting room