

## CO<sub>2</sub> MONITORING MODULES

Metal oxide semiconductor type CO<sub>2</sub> sensor: SB-AQ6A  
 CO<sub>2</sub> 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 CO<sub>2</sub> in the range between 400 ppm to 3000 ppm.
- Semiconductor type CO<sub>2</sub> 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
- CO<sub>2</sub> monitoring in living rooms

Two sensor models; Only CO<sub>2</sub> or CO<sub>2</sub> + 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 CO<sub>2</sub> (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 CO<sub>2</sub> sensitivity. Two types of CO<sub>2</sub> sensors are prepared: "SB-AQ6A" for only CO<sub>2</sub> detection, and "SB-AQ6B" for CO<sub>2</sub> and cigarette smoke detection (Hydrogen is used as a typical content in smoke.). With these sensors, it is possible to monitor CO<sub>2</sub> 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 CO<sub>2</sub> concentration.

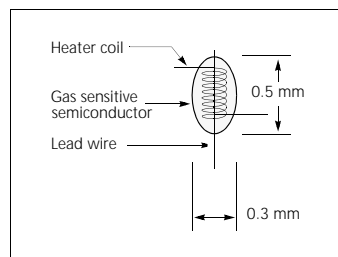


Fig 1. Sensing element

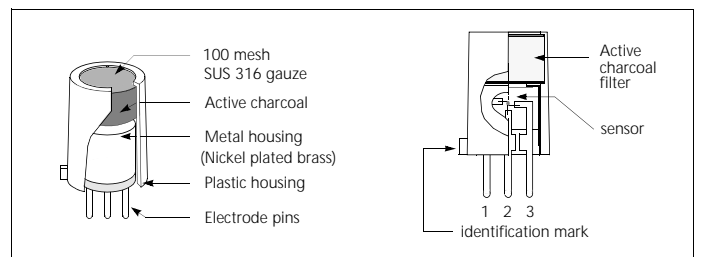


Fig 2. Configuration

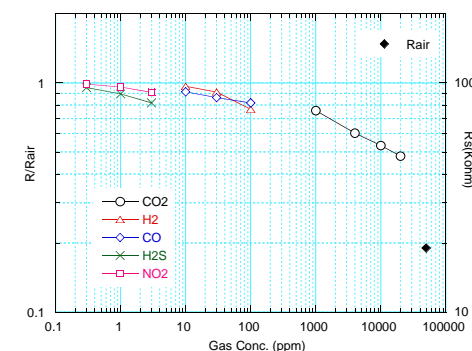


Fig 3. Cross sensitivity (SB-AQ6A)

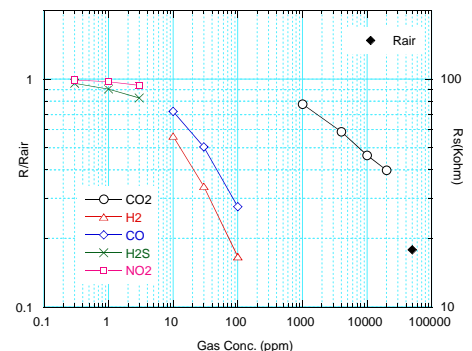


Fig 3. Cross sensitivity (SB-AQ6B)

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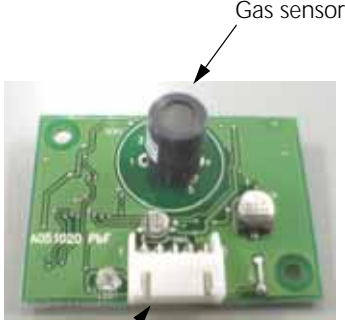
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## Products Range of CO<sub>2</sub> monitoring modules

### Basic specifications

- Power supply: 5V DC ± 5%
- Initial warm-up time: 2 minutes 30 seconds
- Sensor: SB-AQ6A (for CO<sub>2</sub>) or SB-AQ6B (for CO<sub>2</sub> 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<sub>2</sub>, 3ppm of H<sub>2</sub>
- Power consumption: Lower than 200mW (35mW for sensor) (NOTE: The current may reach 1A immediately after power-on)
- Operating temperature: 0°C to 40°C
- Storage temperature: -10°C to 60°C
- 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	<ul style="list-style-type: none"> <li>• Sensor: SB-AQ6A</li> <li>• Analogue output: 0 to 1V</li> <li>• Alarm conc: 1600ppm of CO<sub>2</sub></li> </ul>	
A051020-AQ6A-02	<ul style="list-style-type: none"> <li>• Sensor: SB-AQ6A</li> <li>• Analogue output: 0 to 5V</li> <li>• Alarm conc: 1600ppm of CO<sub>2</sub></li> </ul>	
A051020-AQ6B-01	<ul style="list-style-type: none"> <li>• Sensor: SB-AQ6B</li> <li>• Analogue output: 0 to 1V</li> <li>• Alarm conc: 1600ppm of CO<sub>2</sub> and 3ppm of H<sub>2</sub></li> </ul>	
A051020-AQ6B-02	<ul style="list-style-type: none"> <li>• Sensor: SB-AQ6B</li> <li>• Analogue output: 0 to 5V</li> <li>• Alarm conc: 1600ppm of CO<sub>2</sub> and 3ppm of H<sub>2</sub></li> </ul>	
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	<p>Operation procedure</p> <ol style="list-style-type: none"> <li>1. Connect 5V DC to pins 1 and 2.</li> <li>2. Wait for more than 3 minutes as a warm-up time.</li> <li>3. Measure analogue output from pins 3 and 4 to convert CO<sub>2</sub> concentration.</li> <li>4. Disconnect power supply from the module when the measurement is finished.</li> </ol> <p>* 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.</p> <p>* The relationship between analogue output and CO<sub>2</sub> concentration is as below: 0 to 1V output model: ppm of CO<sub>2</sub> = (mV x 5) + 400 0 to 5V output model: ppm of CO<sub>2</sub> = mV+400</p>	

### Example of monitoring CO<sub>2</sub> in a meeting room

