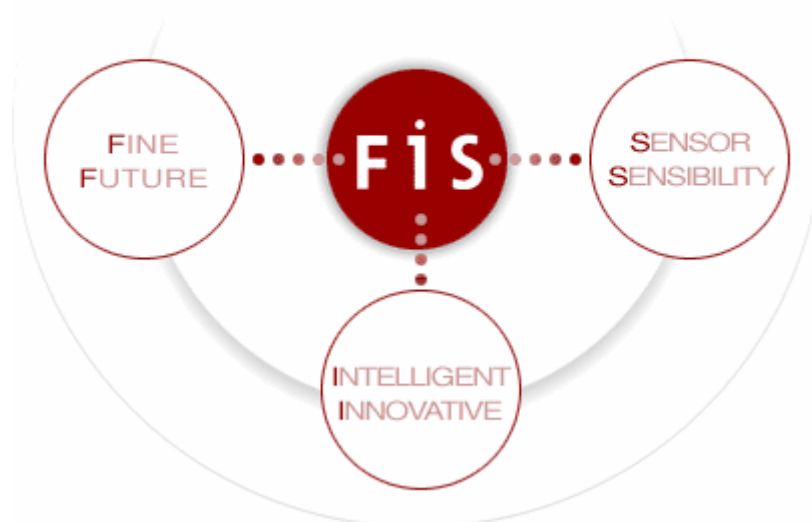




FiS aims to develop
high quality gas sensors
for advanced technology
in the future.



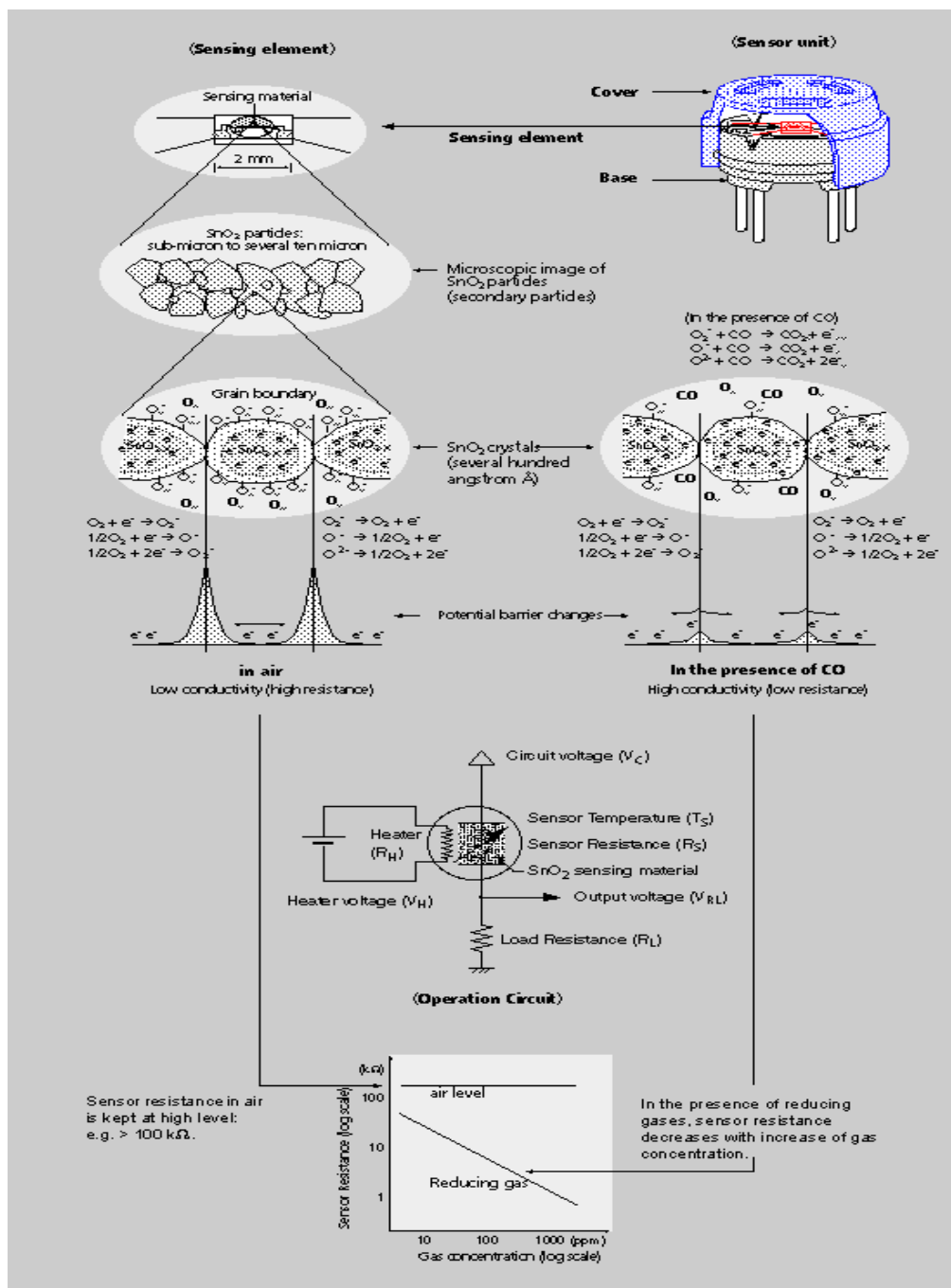
SENSORES

DETECTION PRINCIPLE

In general, semiconductor gas sensors are composed of three parts:

- 1 Sensing element: including electrodes connections (**RED** part in the figure below. Sensor unit)
- 2 Base: base materials, electrode points (**BLACK** part)
- 3 Cap: mechanical protection, flame proof, air flow regulation (**BLUE**)

The tin dioxide (SnO_2) metal oxide semiconductor material is heated to a specific temperature (e.g. at 400°C for hydrocarbon detection). The resistance of sensing material changes rapidly according to gas concentration changes. This is caused by adsorption/desorption of oxygen and reaction between surface oxygen and gases. These reactions cause a dynamic change of electric potential on SnO_2 crystal and results in the decrease of sensor resistance under the presence of reducing gases such as CO, methane, hydrogen. The figures below indicate the sensing mechanism of the SnO_2 gas sensor.



GAS SENSOR

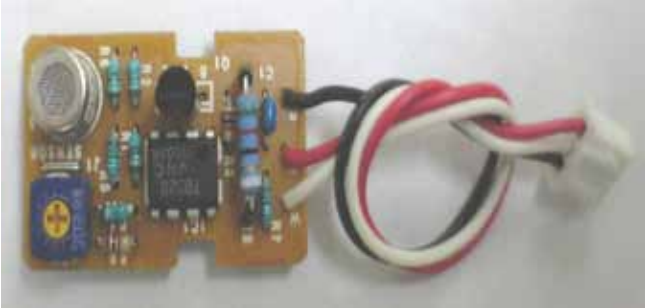

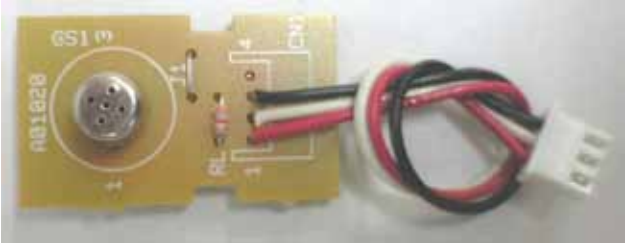



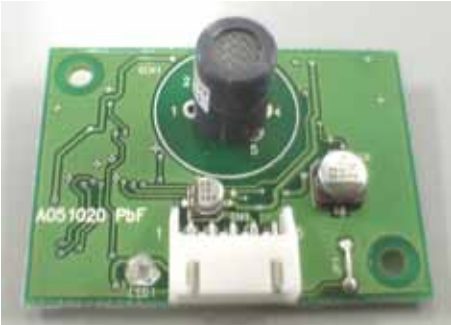


SB Series

SP Series

Categories	Detection gas	Model	Model
Gas detectors	CO and methane	SB-95-12	
	Fuel gas	SB-11B-00	SP-11-00
	Methane	SB-12A-00	SP-12A-00
	Propane/Butane	SB-15-00	SP-15A-00
	Carbon Monoxide	SB-500-12	
	Hydrogen	SB-19-00	SP-19-00
	Organic Solvents	SB-30-00	SP-31-00
Refrigerant	Freon (R-22)	SB-41-00	SP-41-00
	Freon(R-134a, R-410a, R-407C)	SB-42A-00	SP-42A-00
	Ammonia		SP-53A-00 (High conc.) SP-53B-00 (Low conc.)
Environmental monitoring	Carbon monoxide	SB-500-12	
	Ozone		SP-61-00
	Nitrogen oxides		SP-62 (under development)
Fuel cell	Hydrogen	SB-42A-11	
	Methane	SB-12A-00	SP-12A-00
Portable checkers	Breath	SB-EN3-02	
	Alcohol	SB-EN2-02	
		SB-30-00	
Indoor air quality	General purpose	SB-AQ1-04	SP3-AQ2-01 SP3S-AQ2-01
	CO2	SB-AQ6A-00	
	Gas and CO2	SB-AQ6B-00	SP6-AQ6-00
Air damper control in automobiles	Gasoline exhaust gas	SB-AD3-00	
	Diesel exhaust gas	SB-AD2-00	

EVALUATION MODULES

Field	Model	Description and functions	Pictures
General purpose	EVM-SB-01	<p>Evaluation modules for SB series gas sensors. Specify the sensor model No. when ordering.</p> <ul style="list-style-type: none"> * Compact design * Low power consumption * Power supply: 5V DC * Output: 0 to 3.5V DC * 3 wired connector attached (10cm) 	 <p>A photograph of the EVM-SB-01 evaluation module. It is a small, rectangular printed circuit board (PCB) populated with various electronic components including a microcontroller, resistors, and a gas sensor. A three-wire cable (red, black, and white) is connected to the board and terminated with a white plastic connector.</p>
	EVM-SP-01	<p>Evaluation modules for SP series gas sensors. Specify the sensor model No. when ordering.</p> <ul style="list-style-type: none"> * Compact design * Low power consumption * Power supply: 5V DC * Output: 0 to 4V DC * 3 wired connector attached (10cm) 	 <p>A photograph of the EVM-SP-01 evaluation module. It features a larger, cylindrical gas sensor component mounted on a PCB. A three-wire cable (red, black, and white) is connected to the board and terminated with a white plastic connector.</p>
	EVM-SP-02	<p>Evaluation modules for SP3 and SP3S series gas sensors. Specify the sensor model No. when ordering.</p> <ul style="list-style-type: none"> * Compact design * Low power consumption * Power supply: 5V DC * Output: 0 to 4V DC * 3 wired connector attached (10cm) 	 <p>A photograph of the EVM-SP-02 evaluation module. It is a small PCB with a circular gas sensor mounted on it. A three-wire cable (red, black, and white) is connected to the board and terminated with a white plastic connector.</p>
	FIS2001 -01 -21 -31 -41 -SP11	<p>Smart sensors for evaluating the performance of gas concentration monitor and gas leak detection. The following models are available.</p> <ul style="list-style-type: none"> -01: for CO/CH4 -21: for CO/LPG -31: for CH4 -41: for H2 -SP11: for O3 	 <p>A photograph of the FIS2001 smart sensor module. It is a green PCB with a large, black cylindrical gas sensor mounted on top. The board contains several integrated circuits and other electronic components. A three-wire cable is connected to the bottom of the board.</p>

<p>Carbon dioxide</p>	<p>A051020 -AQ6A-01 -AQ6A-02 -AQ6B-01 -AQ6B-02</p>	<p>CO2 sensor evaluation modules</p> <ul style="list-style-type: none"> * Power supply: 5V DC * Analogue output: 0 to 1V or 0 to 5V * Alarm concentration: 1600ppm of CO2, 3ppm of H2 <p>-AQ6A-01: CO2 only, output 0 to 1V -AQ6A-02: CO2 only, output 0 to 5V -AQ6B-01: CO2 and H2, output 0 to 1V -AQ6B-02: CO2 and H2, output 0 to 5V</p>	 <p>The image shows a green printed circuit board (PCB) for a CO2 sensor evaluation module. It features a large black cylindrical sensor component in the center, a white multi-pin connector at the bottom, and various electronic components like resistors and capacitors. The text 'A051020 PbF' is printed on the board.</p>
<p>Ozone</p>	<p>A051020 -SP61-01 -SP61-02</p>	<p>Ozone sensor evaluation module</p> <ul style="list-style-type: none"> * Power supply: 5V DC * Analogue output: 0 to 1V or 0 to 5V * Alarm concentration: 80ppb of Ozone <p>-SP61-01: Output 0 to 1V -SP61-02: Output 0 to 5V</p>	 <p>The image shows a green PCB for an ozone sensor evaluation module. It features a large, spherical, mesh-covered sensor component in the center, a white multi-pin connector at the bottom, and various electronic components. The text 'A051020 PbF' is printed on the board.</p>
	<p>A051020 -SP61-01F -SP61-02F</p>	<p>Ozone monitor</p> <ul style="list-style-type: none"> * Power supply: 5V DC * Analogue output: 0 to 1V or 0 to 5V * Alarm concentration: 80ppb of Ozone <p>-SP61-01F: Output 0 to 1V -SP61-02F: Output 0 to 5V</p>	
<p>Hydrogen</p>	<p>EVM-HY01-S</p>	<p>Hydrogen sensor evaluation module</p> <ul style="list-style-type: none"> * Power supply: 12V DC * Analogue output: 0 to 5V DC * LCD display: 0 to 20000ppm 	 <p>The image shows a green PCB for a hydrogen sensor evaluation module. It features a white multi-pin connector at the top, several electronic components, and a small LCD display area. The board is populated with various components including resistors, capacitors, and integrated circuits.</p>