SB-15B

FIS GAS SENSOR SB-15B

for LP-GAS (PROPANE/BUTANE) DETECTION

The SB-15B is a tin dioxide semiconductor gas sensor which has an excellent performance in propane/butane detection. The features are: high sensitivity, low sensitivity to noise gases, quick response speed, strong poisoning resistance and significant low power consumption design (120 mW).

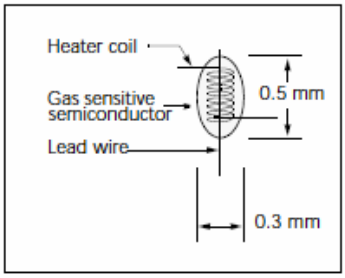


Fig 1a. Sensing element

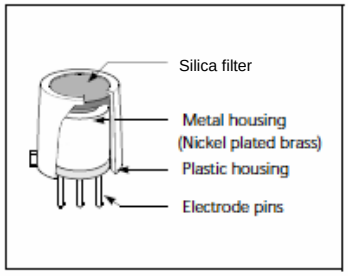


Fig 1b. Configuration

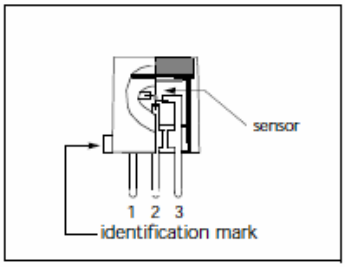


Fig 1c. Pin Layout

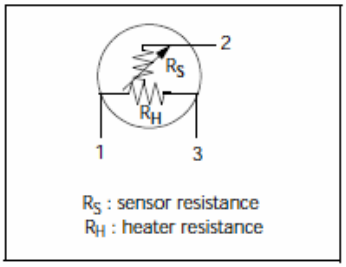


Fig 1d. Equivalent circuit

Structure
Gas sensitive semiconductor material is a mini bead type and a heater coil and electrode wire are embedded in the element. The sensing element is installed in the metal housing which uses double stainless steel mesh (100 mesh) in the path of gas flow. The mesh is an anti-explosion feature (Fig 1b).

Operating conditions
Fig 2 shows the standard operating circuit for this model. The change of the sensor resistance (RS) is obtained as the change of the output voltage across the fixed or variable resistor (RL). In order to obtain the best performance and specified characteristics, the values of the heater voltage (VH) circuit voltage (VC) and load resistance (RL) must be within the range of values given in the standard operating conditions shown in the specification table on the next page.

Sensitivity characteristics
Fig 3 shows the sensitivity characteristics curves of the SB-15B (typical data). Sensitivity characteristics of the FIS gas sensors are expressed by the relationship between the sensor resistance and gas concentration. The sensor resistance decreases with an increase of gas concentration based on a logarithmic function.

The sensitivity characteristics of the SB-15B is specified by the following parameters.
- Sensor resistance level: at iso-butane 1000 ppm
- Sensor resistance change ratio: between iso-butane 1000 ppm and 3000 ppm
- Sensitivity of iso-butane: the sensor resistance ratio of between in air and at iso-butane 1000ppm

See the specification table on the next page for further details.

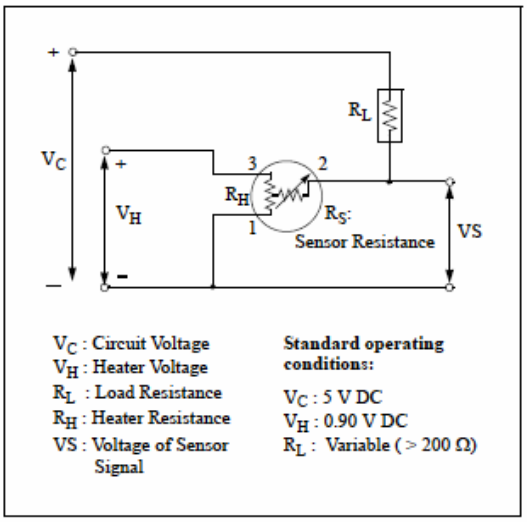


Fig 2. Standard circuit

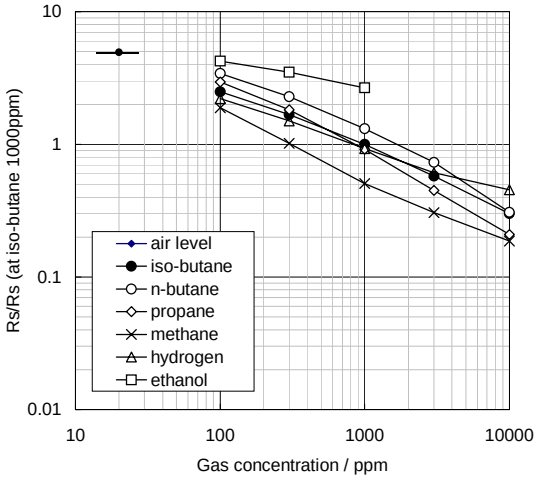


Fig 3. Sensitivity characteristics

SPECIFICATIONS

Specifications

A. Standard operating conditions

Symbol	Parameter	Specification	Conditions etc.
V_H	Heater voltage	0.9V±5%	Recommendation ; ±2%
V_C	Circuit voltage	Less than 5 V	DC: Pin2 (+) - Pin 1 (-)
R_L	Load resistance	Variable (>200Ω)	Choose the most suitable
R_H	Heater resistance	2.8Ω±0.2Ω	at room temperature
I_H	Heater current	132mA±15mA	at VH=0.9V
P_H	Heater power consumption	120mW	

It is possible to choose pulse DC drive (ex. 5VDC) for VH.

B. Environmental conditions

Symbol	Parameter	Specification	Conditions etc.
Tao	Operating temperature	-10 °C to 50 °C	Please consult FIS for operating and/or storing sensors out of the specified ranges.
Tas	Storage temp	-30 °C to 70 °C	
RH	Relative humidity	Less than 95%RH (Do not condense into dew)	
Others		Exposure to solvents and/or silicone compounds must be avoided. Sensitivity characteristics may be effected.	

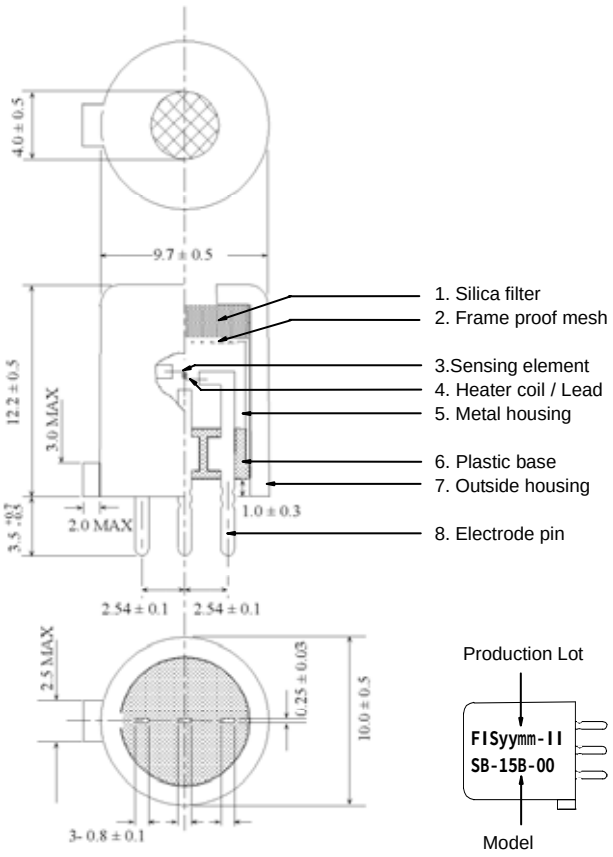
C. Sensitivity characteristics

Model	SB-15B-00		
Symbol	Parameter	Specification	Conditions etc.
R_S	Sensor resistance	0.3 kΩ ～ 3.0kΩ	at 1000 ppm of iso-butane
β	Slope	0.55 ～ 0.75	$\frac{R_S \text{ (at IB 3000 ppm)}}{R_S \text{ (at IB 1000 ppm)}}$
Sensitivity of iso-butane		more than 3	$\frac{R_S \text{ (in air)}}{R_S \text{ (at IB 1000 ppm)}}$
Standard Test Conditions:		Temp: 20 °C ± 2 °C Humidity:65% ± 5% (in clean air) Pre-heating time: more than 4 days	

D. Mechanical characteristics

Items	Conditions	Specifications
Vibration	Frequency: 5 -500 Hz Acceleration: 1.3G Sweep Time: 40min.	Should satisfy the specifications shown in the C. Sensitivity characteristics after test
Drop	Height: 60 cm Number of impacts: 3 times	

Dimensions



Scale : mm

Weight : 1.1g

E. Parts and Materials

No.	Parts	Materials
1	Silica filter	Silica
2	Frame proof mesh	SUS 316 (100 mesh, double)
3	Sensing element	Tin dioxide
4	Heater coil / Lead wire	Platinum
5	Metal housing	Nickel plated brass
6	Plastic base	PBT (GF30%)
7	Outside housing	Nylon 6 (UL94 V-0)
8	Electrode pin	Iron-nickel alloy

Please contact

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FIS Inc.
3-36-3, Kitazono
Itami, Hyogo
664-0891 Japan

Tel: +81-72-780-1800
Fax: +81-72-785-0073
http://www.fisinc.co.jp