ELFA artikelnr.

73-093-47 AF63 gassensor

(1) Operating Conditions

Table 1 : Operating Conditions of the AF63

Parameter	Ratings
Operating Temperature	-10℃～55℃
Strage Temperature	-30℃～85℃
Load Resistor R_L	Variable
Rated Sensor power consumption Ps	Ps≦15mW
Rated Working Voltage of Curcuit Vc	DC or AC 5V (Max12V)
Rated Working Voltage of Heater	DC or AC 5V ± 0.2V

$$Ps = \frac{Vc^2 \cdot Rs}{(Rs+R_L)^2}$$

Rs : Sensor Resistance

(2) Specifications

(2-1)Sensitivity Characteristics

Table 2 : Sensitivity Characteristics

Items	Ratings
Gas Sensitivity Sensor Resistance	0.07≦R_{GAS}/R_{AIR}≦0.20 3KΩ≦R_{AIR}≦12KΩ R_{AIR} is Sensor resistance in the clean air without noise gases. R_{GAS} is Sensor resistance in the air containing 100ppm ethanol. Temperature:25±2℃、Humidity:50±5%RH
Power Consumption	680mW (Max)

(2-2)Mechanical Durability

It displays excellent resistance against shock or vibration, since the gas-sensitive element is fixed on the ceramic board being sandwiched from the both sides by a pair of electrodes, and baked hard concomitantly with the formation of the external protection film.

Table 3 : Mechanical Durabikity of the AF-Series

Items	Test Conditions	Criterion
Vibration Test	Frequency : 10-500Hz Amplitude(10-50Hz) : 2mm Acceleration(50-500Hz) : 10G Reciprocal scanning time : 5min Test time 2 hours respective for X, Y and Z directions	It maintain the characteristics shown in Table 2.
Shock Proof Test	Acceleration : 200G Number of impacts : 5	

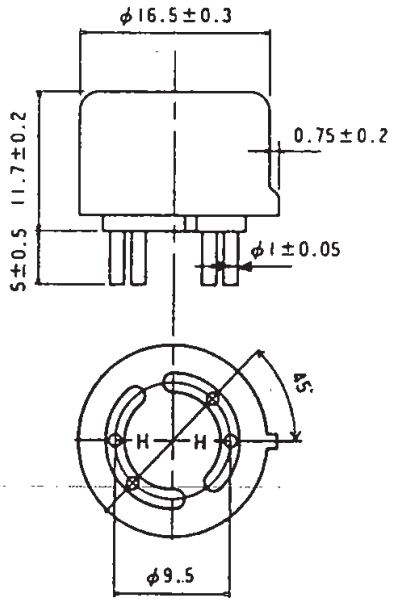
(2-3)Material

Table 4 : Material of the AF63

Name	Material
Sensing Element	Semiconducting oxide
Thick-file Heater	Platinum
Lead Wire	Platinum alloy
Case	Nylon 66
Pin	Nickel alloy
Flame Arrestor	Double 100-mesh stainless steel gauze (SUS 316)

(2-4)Appearance and Dimentions

Fig. 1 : Appearance and Dimentions of the AF-Series



(3) Characteristics

(3-1) Sensitivity

Fig. 2 is shows the typical sensitivity characteristics of the AF63 for the several gases. The sensitivity denotes the ratio (R_{GAS}/R_{AIR}) of the sensor resistance obtained in the gas-containing air (R_{GAS}) to the sensor resistance obtained in the clean ari without noise gases (R_{AIR}) .

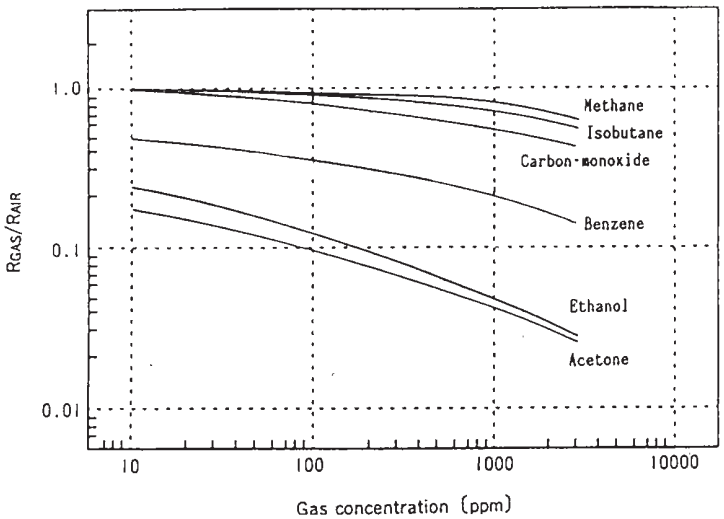


Fig. 2 : Sensitivity Characteristics
R_{AIR} is Sensor resistance in the clean air.
R_{GAS} is Sensor resistance in various concentrations of gases.
The measurments have done after operating more than 48 hours.

(3-3)Dependence on Temperature and Humidity

Genelally sensor resistance is influenced by temperature and humidity. Fig. 4 is shows the typical dependence of the AF63 on temperature and humidity. The AF63, similar as the conventional gas sensor, is not totally free from influence by temperature and humidity. But the dependence of the AF63 on temperature and humidity is small in comparison with the conventional gas sensors.

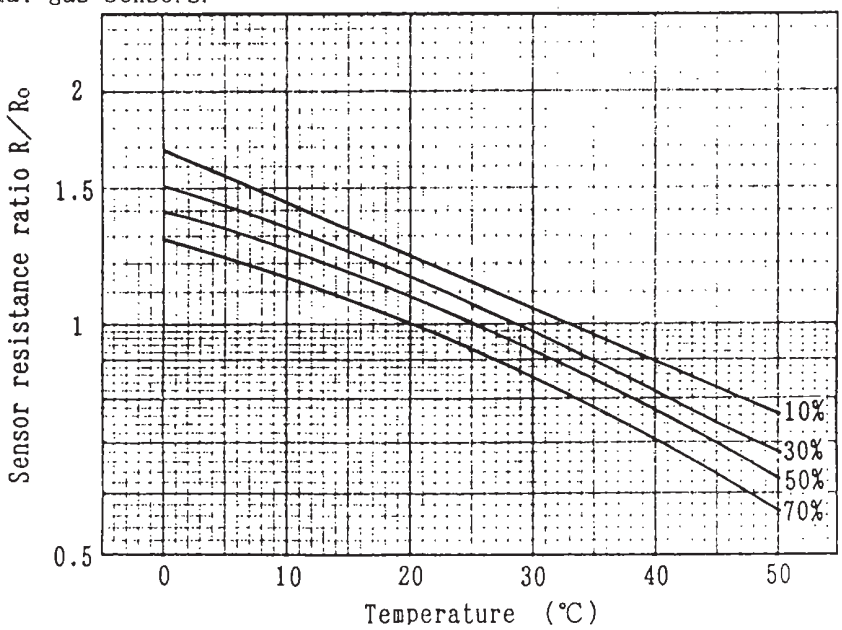


Fig. 4 : Dependence of the AF63 on Temperature and Humidity
R_O is Sensor resistance in the air at 25℃ 50%RH.
R is Sensor resistance in the air at different temperature and humidity.

(4) Basic Test Circuit

The pin allocation of the AF-Series is shown in Fig. 5, where pins No.1 and No.3 are connected to the heater section, and pins No.2 and No.4 to the sensor section.

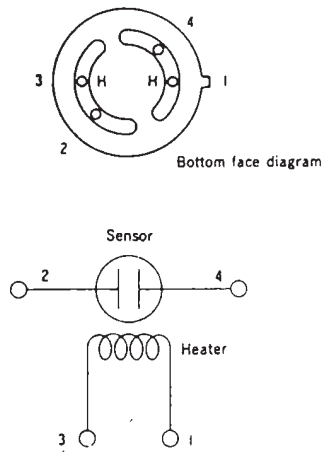
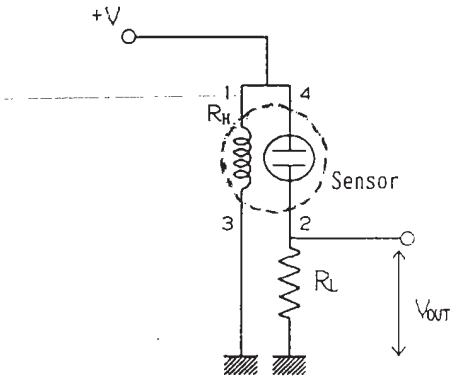


Fig. 5 : Pin Allocation

The basic test circuit for use with AF-Series is shown in Fig. 6. The circuit voltage and the heater voltage are applied in the basic test circuit shown below. The AF-Series is designed to operated with a stabilized 5V. And then any heater voltage value higher or lower than 5V will adverserly affect the sensitivity characteristics.



Vc :Circuit voltage

RL :Load resistance

VOUT:Output voltage

Fig. 6 : Basic Test Circuit

In this test circuit, the sensor resistance (R_S) is calculated from output voltage(V_{OUT}) by the following formula.

$$R_S = \frac{V_C - V_{OUT}}{V_{OUT}} \cdot R_L$$

The sensitivity denotes the ratio (R_{GAS}/R_{AIR}) of the sensor resistance obtained in the gas-containing air (R_{GAS}) to the sensor resistance obtained in the clean ari without noise gases (R_{AIR}) .

(5) Standard Test Conditions

(5-1)Atomospheric Conditions

Clean air with 25±2℃ and R.H. 50±5% (without noise gases)

(5-2)Circuit Conditions

V_C (Circuit voltage) : 5 ±0.05 V
V_H (Heater voltage) : 5 ±0.05 V
R_L (Load resistance) : 5 KΩ±1%

(5-3)Test Gas

Ethanol : 100 ppm

【NOTES】

- Measure the gas sensor characteristics after operating more than 24 hours, because it must be measured after fully stabilizing of the sensor.
- Sensor characteristics must be measured in clean air without noise gases.
- If the sensor is used after it is left for long time under high humidity without current supply, it will take some time untill its characteristics are stabilized. In general, the longer it is left under high humidity, the more the time will be taken to stabilize the characteristics.
- The sensors display excellent resistance against shock and vibration, but do not apply excessive shock and vibration to it.
- If it is to be used or stored in a special environment or gas, consult with us in advance.
- If it is used as an industrial item, or if detecting accuracy is required, check the operation periodically(more than once/year).