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FIGARO

PRODUCT INFORMATION

TGS 832-A00 - for the detection of Chlorofluorocarbons

Features:

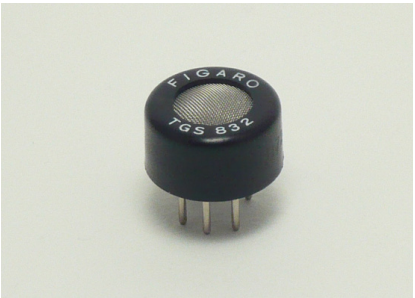
* High sensitivity to refrigerant gases
* Quick response
* Long term stability
* Uses simple electrical circuit

Applications:

* Portable and fixed installation refrigerant leak detectors

The sensing element of Figaro gas sensors is a tin dioxide (SnO_2) semiconductor which has low conductivity in clean air. In the presence of a detectable gas, the sensor's conductivity increases depending on the gas concentration in the air. A simple electrical circuit can convert the change in conductivity to an output signal which corresponds to the gas concentration.

The **TGS 832-A00** has high sensitivity to refrigerant gases commonly used in air conditioning systems and refrigerators such as R-134a, R-404a, R-407c, and R-410. TGS832-A00 has a gas diffusion hole in the sensor cap as well as in the sensor base. By using the sensor with a suction pump, response speed can be accelerated, making it suitable for portable gas leakage checkers.



The figure below represents typical sensitivity characteristics, all data having been gathered at standard test conditions (see reverse side of this sheet). The Y-axis is indicated as sensor resistance ratio (Rs/Ro) which is defined as follows:

Rs = Sensor resistance of displayed gases at various concentrations

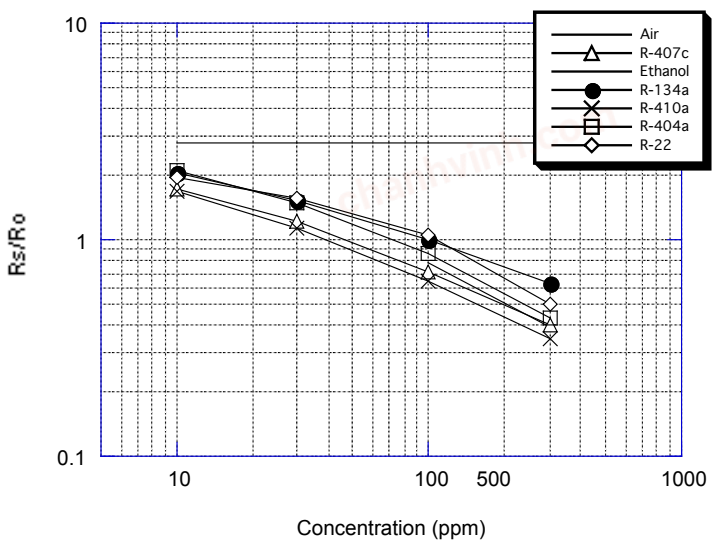
Ro = Sensor resistance at 100ppm of R-134a

The figure below represents typical temperature and humidity dependency characteristics. Again, the Y-axis is indicated as sensor resistance ratio (Rs/Ro), defined as follows:

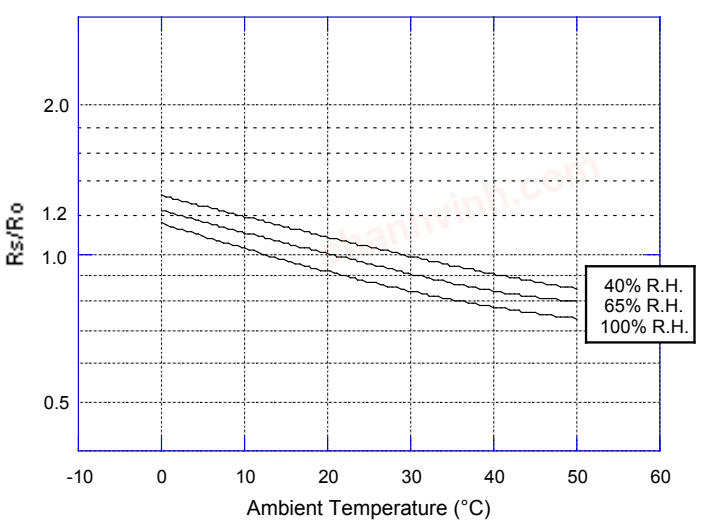
Rs = Sensor resistance at 100ppm of R-134a at various temperatures/humidities

Ro = Sensor resistance at 100ppm of R-134a at 20°C and 65% R.H.

Sensitivity Characteristics:



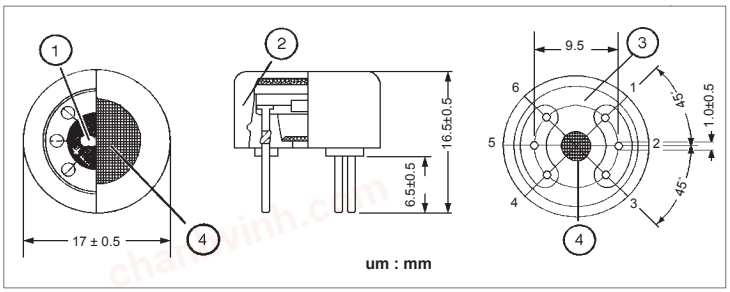
Temperature/Humidity Dependency:



IMPORTANT NOTE: OPERATING CONDITIONS IN WHICH FIGARO SENSORS ARE USED WILL VARY WITH EACH CUSTOMER'S SPECIFIC APPLICATIONS. FIGARO STRONGLY RECOMMENDS CONSULTING OUR TECHNICAL STAFF BEFORE DEPLOYING FIGARO SENSORS IN YOUR APPLICATION AND, IN PARTICULAR, WHEN CUSTOMER'S TARGET GASES ARE NOT LISTED HEREIN. FIGARO CANNOT ASSUME ANY RESPONSIBILITY FOR ANY USE OF ITS SENSORS IN A PRODUCT OR APPLICATION FOR WHICH SENSOR HAS NOT BEEN SPECIFICALLY TESTED BY FIGARO.

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Structure and Dimensions:

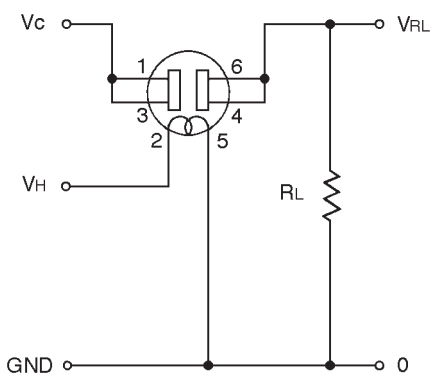


① Sensing Element:
SnO_2 is sintered to form a thick film on the surface of an alumina ceramic tube which contains an internal heater.
② Sensor Cap
③ Sensor Base:
Nylon 66
④ Flame Arrestor:
100 mesh SUS316 double gauze

Pin Connection and Basic Measuring Circuit:

The numbers shown around the sensor symbol in the circuit diagram at the right correspond with the pin numbers shown in the sensor's structure drawing (above). When the sensor is connected as shown in the basic circuit, output across the Load Resistor (V_{RL}) increases as the sensor's resistance (Rs) decreases, depending on gas concentration.

Basic Measuring Circuit:



Standard Circuit Conditions:

Item	Symbol	Rated Value	Remarks
Heater voltage	V_H	5.0±0.2V	AC or DC
Circuit volatge	V_C	max. 24V	DC only Ps≤15mW
Load Resistance	R_L	variable	0.45kΩ min.

Electrical Characteristics:

Item	Symbol	Condition	Specification
Sensor resistance	Rs	R-134a at 100ppm/air	4kΩ ~ 40kΩ
Change ratio of sensor resistance	Rs/Ro	$\frac{\text{Rs (R-134a at 300ppm/air)}}{\text{Rs (R-134a at 100ppm/air)}}$	0.50 ~ 0.65
Heater resistance	R_H	Room temperature	30.0 ± 3.0Ω
Heater power consumption	P_H	V_H=5.0V	835mW (typical)

Standard Test Conditions:

TGS 832 complies with the above electrical characteristics when the sensor is tested in standard conditions as specified below:

Test Gas Conditions: 20°±2°C, 65±5%R.H.
Circuit Conditions: V_C = 10.0±0.1V (AC or DC),
V_H = 5.0±0.05V (AC or DC),
R_L = 10.0kΩ±1%
Preheating period before testing: More than 7 days

Sensor Resistance (Rs) is calculated by the following formula:

$$Rs = \left(\frac{V_C}{V_{RL}} - 1\right) \times R_L$$

Power dissipation across sensor electrodes (Ps) is calculated by the following formula:

$$Ps = \frac{V_C^2 \times Rs}{(Rs + R_L)^2}$$

FIGARO USA, INC.
121 S. Wilke Rd. Suite 300
Arlington Heights, IL 60005
Phone: (847)-832-1701
Fax: (847)-832-1705
email: figarousa@figarosensor.com

For information on warranty, please refer to Standard Terms and Conditions of Sale of Figaro USA Inc.