



Gas Sensors



World leader in gas sensing innovation

FIGARO

ISO9001 Company

The World Leader in Gas Sensing Innovation

The World Leader in Gas Sensing Innovation, Figaro has more than 45 years of experience in supplying cost-effective gas sensing solutions in the fields of safety, air quality control, HVAC, home appliance, and the automotive industry.



Our Company

Figaro is a global provider of sensing solutions in the fields of safety, comfort & health, and controls & measurements. Founded by Naoyoshi Taguchi, who pioneered the application of metal oxide semiconductors (MOS) to gas sensing, Figaro was the first company to successfully commercialize MOS type gas sensors. Its technical expertise has been recognized and awarded over the years by various industry and professional organizations. Expanding its reach into the gas sensing field, Figaro has added new technologies to its product lines, such as electrochemical sensors and catalytic type sensors. To date, more than 300 million Figaro gas sensors of various types have been supplied to the gas sensing market, and Figaro is acknowledged as the world leader in the development and high-volume production of quality gas sensors. Industries for gas detection, fire detection, safety, air quality control, HVAC, appliances, automotive applications, and information and communications technology throughout the world have all relied on Figaro for cost-effective solutions to their gas sensing needs for more than 45 years.

As a full service company in the gas sensing industry, Figaro understands customer needs from development to production to on-time delivery. Figaro products are manufactured to the highest quality standards in our state-of-the-art facilities. Our flexible production system and ample capacity ensure just-in-time supply for any high-volume requirements.

In Rossini's opera, "The Barber of Seville", the main character is Figaro, a unique individual with boundless enthusiasm, curiosity, creativity, and the drive to tackle any problem, no matter how difficult. These are the qualities upon which Figaro was founded, so it was natural that the company assumed this name. Figaro strives to meet each challenge with the same vitality and spirit as its namesake.

World Class Product Support

Together with our products comes access to Figaro's unparalleled product support services. Starting at initial design and continuing through successful launch of customer production and beyond, Figaro provides in-depth technical support to its customers with a worldwide reach. With support staff located in Japan, North America, and China, and with a comprehensive network of distributors worldwide, technical assistance is readily available, and our engineers are prepared to respond to your needs verbally, in writing, as well as with timely in-person visits. Figaro's ability to support your efforts worldwide is unmatched among gas sensor suppliers in today's marketplace.

Visit www.figaro.co.jp for more information, including data sheets.

Quality Our No. 1 Priority

Figaro is widely recognized throughout the global gas sensing industry for its goal of producing the highest quality gas sensors. Figaro's commitment to excellence is reflected in the fact that it was one of the first gas sensor manufacturers to obtain **ISO9001** certification and has obtained UL component recognition for many of its products. Providing reliable products is paramount in the gas sensing industry where protection of lives and property is the main focus.



Features

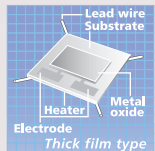
- Low power consumption
- Reliable
- Long life
- Competitive cost
- Easy to use
- Compact size
- Environmentally friendly
- UL component recognition
- Meets and exceeds requirements of performance standards
- **ISO9001** company
- More than 45 years of experience in the marketplace
- Global engineering support for both applications and implementation
- Continuous product support after point-of-sale
- Innovative

Advanced Sensor Technologies

Metal Oxide Semiconductor Sensors

Figaro's signature technology is the metal oxide semiconductor (MOS) type gas sensor. The original generation of bulk type MOS sensors was called as Taguchi Gas Sensor (TGS). This type of sensor uses metal oxide semiconductor doped with noble metal for the sensing material. When heated to a certain high temperature, a chemical reaction occurs on the sensor surface in the presence of deoxidizing gases, resulting in a large drop in resistance. Since this reaction mechanism is reversible, the sensor possesses a long life, as much as 10 years in some applications.

Thick film type

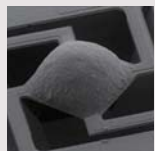


Figaro has developed thick film type sensors which use a screen printing method to form the sensing element, offering the advantage of narrow sensor to sensor variation within production lots. Manufactured by using automatic assembling equipment, these sensors provide cost-effective solutions for high-volume requirements.

Micro-bead type

Micro-bead type sensors offer the capability of dual gas sensing of both methane and CO gas with a single sensor element. Driven by dual heater voltages, the sensor offers the advantage of low power consumption and low voltage driving due to its minute heater coil and miniaturized sensing element.

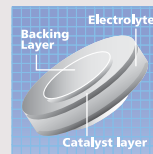
MEMS type



MEMS type sensors are Figaro's latest development using state-of-the-art micro-technology. They offer the lowest power consumption among MOS type Figaro sensors and possess ultra-compact size, making them suitable for battery-operated devices. The sensors are provided in surface-mount packages on tape and reel, making them suitable for automatic placement systems.

Electrochemical Sensors

Liquid electrolyte type



Electrochemical type sensors show high accuracy, linear response, and exhibit good selectivity to CO gas. With no requirement for heater power, they are suitable for battery operated devices. This type of sensor uses environment-friendly weak alkaline liquid electrolyte.

Equipped with a water reservoir, they maintain excellent stability over a wide range of operating conditions and have long life expectancy.

Solid electrolyte type

This type of sensor uses solid electrolyte in the gas sensing layer similar in structure to the liquid electrolyte type sensor, exhibiting good selectivity to CO gas. Using advanced sensing material, solid electrolyte sensors can be operated without a water reservoir, and as a result they offer unparalleled compact size, expanding the field of application to size-oriented devices.

Catalytic Sensors

The target gas burns on a heated catalytic bead, generating heat which produces a change in resistance proportional to the gas concentration. Developed with Figaro's extensive experience in catalyst and filter material technologies, this type of sensor features excellent durability against poisoning, linear output, and long life.

Infrared Sensors

IR sensors operate on the basic principle that gas molecules absorb light in a unique absorption bands. Figaro's IR sensor uses a single light source in tandem with two optical filters to identify the presence of target gas and to produce a reference signal that can compensate for long term drift of the optical elements. The difference in intensity between the target gas and reference wavelengths is proportional to gas concentration, resulting in greater accuracy over time.

A World of Sensing Solutions



Safety

- Toxic and explosive gas leak detectors for residential, RV, marine, and industrial applications
- Portable gas leak detectors and alarms
- Industrial gas monitors
- Fuel cell leakage detection
- Gas boiler leak detectors
- Refrigerant leak detectors
- Fire detectors



Comfort & Health

- Personal air quality monitors
- Odor detection
- Air purifiers for residential and automotive usage
- Individual room CO₂ monitors
- VOC monitors for the workplace



Controls & Measurements

- Residential air cleaners and air conditioner control
- Building and room ventilation control
- Automobile damper control
- Parking garage ventilation control
- Automated cooking control in microwave ovens
- Breath alcohol detectors
- Oxygen monitors for medical usage

GAS SENSORS

Target gas	Range	Model No.	Type	Typical application and Features
Air contaminants				
(Hydrogen, ethanol, etc.)	1 - 30ppm H ₂	TGS 2600	S	Indoor air quality control (for general air contaminants detection)
(VOCs, ammonia, H ₂ S, etc.)	1 - 30ppm EtOH	TGS 2602	S	Indoor air quality control (for VOC detection)
(Trimethylamine, methyl mercaptan, etc.)	1 - 10ppm EtOH	TGS 2603	S	Indoor air quality control (for odorous gas detection)
(Hydrogen, ethanol, etc.)	1 - 30ppm H ₂	TGS 8100	S	Indoor air quality control (for general air contaminants detection) / MEMS
Alcohol & solvent vapors	50 - 5,000ppm	TGS 823	S	Alcohol & solvent vapor detectors
	50 - 5,000ppm	TGS 2620	S	Alcohol & solvent vapor detectors
Ammonia	30 - 300ppm	TGS 826	S	Refrigerant leak detectors
	10 - 300ppm	TGS 2444	S	Refrigerant leak detectors, ventilation controls
	0 - 100 / 200 / 1,000 / 5,000ppm	F ECS 44-series	EC	Portable and fixed installation NH ₃ monitors, refrigerant leak detectors
Carbon monoxide	0 - 10,000ppm	TGS 5042	EC	CO detectors for homes, parking garages, and Fire detectors / Long life
	0 - 10,000ppm	TGS 5342	EC	CO detectors for homes, parking garages, and Fire detectors / Compact
	0 - 5,000ppm	TGS 5141	EC	CO detectors for homes, and Fire detectors / Ultra compact
	0 - 1,000ppm	F ECS 40-1000	EC	Portable and fixed installation CO monitors, parking garages
Chlorine	0 - 10ppm	F ECS 45-10	EC	Portable and fixed installation Cl ₂ monitors
Halocarbon	10 - 1,000ppm	TGS 832-A00	S	Portable refrigerant leak detectors
	1,000 - 10,000ppm	TGS 832-F01	S	Stationary refrigerant leak detectors
	5 - 100ppm	TGS 3830	S	Portable refrigerant leak detectors / Low power
	1 - 25%LFL	TGS 2630	S	Stationary leak detectors for low GWP, low-flammable refrigerant gases
Hydrogen	30 - 1,000ppm	TGS 821	S	Hydrogen leak detectors
Hydrogen, Methane & LPG	0 - 100%LEL	TGS 6812	C	Hydrogen & combustible gas leak detectors
Hydrogen sulfide	0 - 100ppm	F ECS 50-100	EC	Portable and fixed installation H ₂ S monitors
LPG	1 - 25%LEL	TGS 2610	S	Gas alarms for homes, recreational vehicles, boats, gas boilers
Methane	1 - 25%LEL	TGS 2611	S	Gas alarms for homes, recreational vehicles, boats, gas boilers
	1 - 25%LEL	TGS 8410*	S	Gas alarms for homes / MEMS
Methane & CO	1 - 25%LEL CH ₄ +50 - 1,000ppm CO	TGS 3870	S	Gas alarms for homes, gas boilers
Methane & LPG	1 - 25%LEL	TGS 2612	S	Gas alarms for homes, recreational vehicles, boats, gas boilers
	0 - 100%LEL	TGS 6810	C	Gas alarms for homes, gas boilers
Nitric oxide	0 - 300ppm	F ECS 41-250	EC	Portable and fixed installation NO monitors, parking garages
Nitrogen dioxide	0 - 30ppm	F ECS 42-20	EC	Portable and fixed installation NO ₂ monitors, parking garages
Oxygen	0 - 30%	SK-25F	EC	Oxygen monitors / Compact
	0 - 100%	KE-series	EC	Oxygen monitors
	0 - 80mg/L	KDS-25B	EC	Dissolved oxygen monitors
Sulfur dioxide	0 - 20ppm	F ECS 43-20	EC	Portable and fixed installation SO ₂ monitors

PRE-CALIBRATED SENSOR MODULES

Target gas	Range	Model No.	Type	Typical application and Features
Carbon dioxide	300 - 5,000ppm	CDM 7160	IR	Air quality control in buildings, homes
Carbon monoxide	0 - 800ppm	CMM 5042	EC	CO detectors for homes, parking garages
Halocarbon	1 - 25%LFL	FCM 2630	S	Refrigerant gas leak detection in air conditioning / refrigeration systems
Hydrogen, Methane & LPG	0 - 14,000ppm	CGM 6812	C	Hydrogen & combustible gas leak detectors
LPG	5 - 20%LEL	LPM 2610	S	Gas alarms for homes
Methane	5 - 20%LEL	NGM 2611	S	Gas alarms for homes

Types S: Semiconductor type / EC: Electrochemical type / C: Catalytic type / IR: Infrared type * : Under development

Figaro Engineering Inc. reserves the right to make changes without notice to any products or product lines herein. Please contact Figaro or our local distributors regarding the availability of Figaro products. For more details about the products listed above, please see our web page. For sensor needs which are not shown above, please contact Figaro at the locations shown below through the contact form in our web page.

HEAD OFFICE

<http://www.figaro.co.jp/>

FIGARO ENGINEERING INC.

1-5-11 Senbanishi, Mino, Osaka 562-8505 JAPAN
Tel. (81) 72-728-2561 Fax. (81) 72-728-0467
E-mail: figaro@figaro.co.jp

AFFILIATED COMPANY

FIGARO USA, INC.

121 S. Wilke Road, Suite 300, Arlington Heights, IL 60005 USA
Tel: (1) 847-832-1701 Fax: (1) 847-832-1705
E-mail: figarousa@figarosensor.com <http://figarosensor.com/>

FIGARO SENSOR (SHANGHAI) CO., LTD.

Room No.1003-1004A, 511 Weihai Road, Shanghai 200041 CHINA
Tel: (86) 21-6253-1501 Fax: (86) 21-6251-2166
E-mail: figaro@figaro-china.com <http://www.figaro-china.com/>