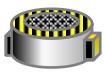
Thermal Conductivity Method Sensor: TE

Stationary sensor
Example: TE-7559

Portable sensor
Example: TE-7561



Portable sensor
Example: TE-7515

1. Brief description

This sensor detects the difference in thermal conductivity to determine the gas concentration. It is a proven combustible gas sensor that effectively detects high-concentration gases.

Category	Detectable gas
Solid	Combustible

2. Structure and principles

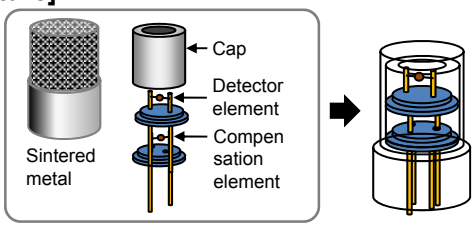
[Structure]

This sensor consists of a detector element and a compensation element. The detector and compensation elements are available in two types: one consists of a coil of a platinum wire and a mixture of glass—a substance inactive against combustible gas—and an alumina support sintered on the coil and the other consists of a coil and an inactive metal or the like coated over the coil. The detector element is designed to allow detectable gases to contact it. The compensation element is enclosed so as not to allow any detectable gas to contact it.

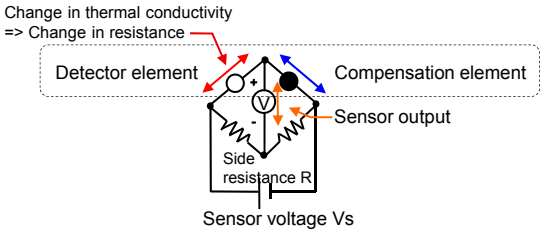
[Principles]

The platinum wire coil heats the detector element to 200℃ to 500℃. Then, a detectable gas comes into contact with the detector element and changes the heat dissipation condition because of the gas-specific thermal conductivity, increasing the temperature of the detector element. With this change in temperature, the platinum wire coil, a component of the element, changes in resistance. The resistance changes almost in proportion to the concentration of the gas.
By allowing the bridge circuit to detect the change in resistance, the sensor determines the gas concentration.

[Structure]



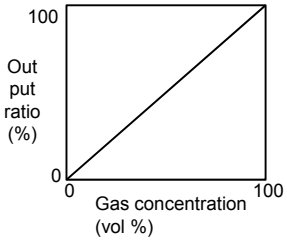
[Bridge circuit]



3. Features (of the sensor TE-7559 as an example)

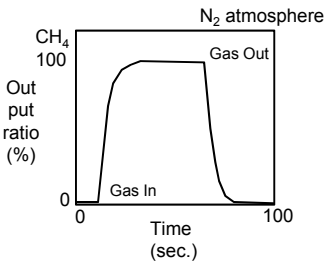
○ Output characteristics

Since the sensor detects changes in the resistance of the platinum wire coil, the output is almost proportional to the concentration until it reaches 100 volume percent. The sensor is suitable for detecting high-concentration gases.



○ Anoxic detection

Since the sensor detects changes in thermal conductivity, it can detect gases even under an anoxic atmosphere. However, it does not detect gases with a small difference in thermal conductivity with the reference gas.



○ Aging characteristics

The sensor physically detects changes in the thermal conductivity of gas, not involving a chemical reaction such as a combustion reaction. This means that it has noting to do with catalyst deterioration or poisoning, providing long-term stability.

○ Detection of incombustible gases

Since the sensor uses gas-specific thermal conductivity, it detects even incombustible gases with a large difference in thermal conductivity, such as high-concentration argon, nitrogen, and carbon dioxide.

4. Detectable gas, model, and detection range (examples)

Detectable gas	Model #	Detection range
Combustible gases in general	TE-7515	0-100 vol %
	TE-7559	
	TE-7560	
	TE-7561	

5. Products of this type (examples)

○ Stationary products

... GD-A80N, GD-A80DN

○ Portable products

... GX-2012, GX-8000

GX-8000