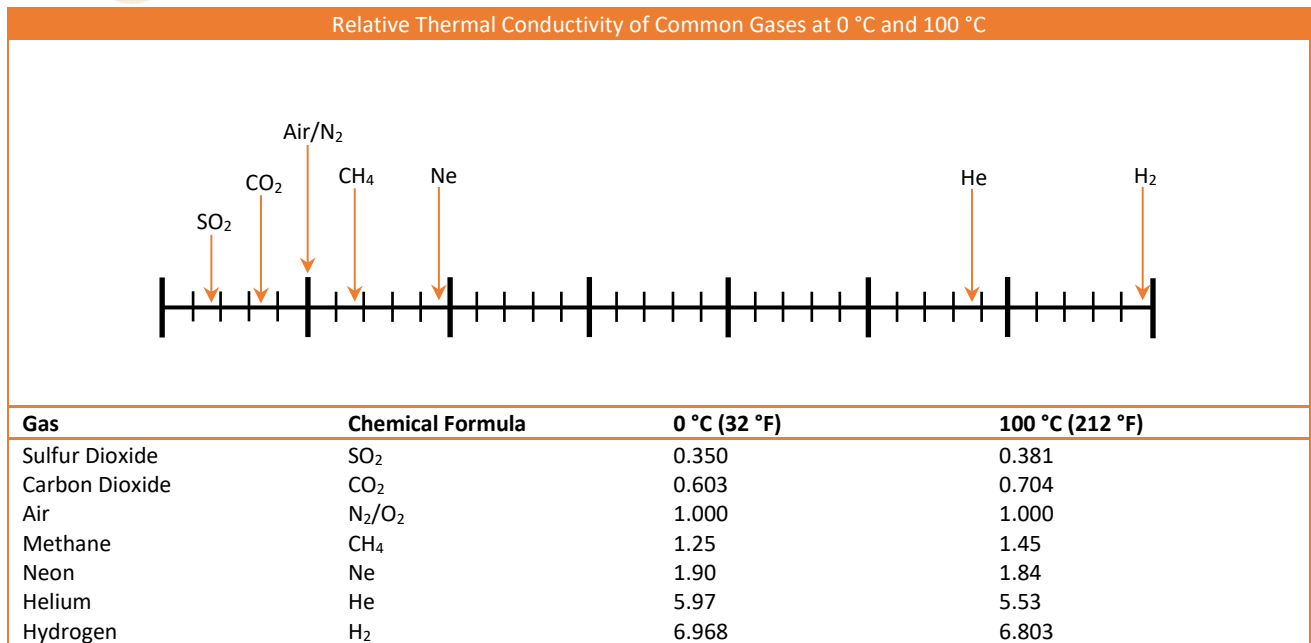


### Thermal Conductivity

Thermal conductivity (TC) is a property of all gases. This can be exploited as each gas has a different TC value and is used to determine the level of one gas in a binary or pseudo-binary mix. Air is a good example of a pseudo-binary mix as it has a fixed proportion of oxygen and nitrogen (both with very similar thermal conductivities). The XEN-5320 Gas sensor utilizes thermal conductivity property to accurately measure one of the two gases present in the sample.



### Principle of operation

The XEN-5320 determines the gas composition by measuring the temperature elevation of a micromachined heater element. For each binary gas mixture, the ratio of temperature increase to heating power is dependent on the mix ratio. For enhanced accuracy, the correction is made for ambient temperature and humidity. The biasing, measurements and correction is done via a Xensor-designed ASIC that utilizes the output from the XEN-3880 thermal conductivity gauge and the temperature and humidity sensor.

### Applications

Monitoring and leak detection of hydrogen, helium, nitrogen and methane gas mixtures in medical, research and development and industrial environments.

#### Measurement Ranges

- 0% to 1%
- 0% to 2%
- 0% to 5%
- 0% to 10%
- 0% to 25%
- 0% to 50%
- 0% to 100%
- 50% to 100%
- 80% to 100%
- 90% to 100%

#### Measurement Gases (Typical)

- H<sub>2</sub> in N<sub>2</sub>, air or CO<sub>2</sub>
- He in N<sub>2</sub> or air
- CO<sub>2</sub> in N<sub>2</sub> or air
- SO<sub>2</sub> in air
- Argon in air
- H<sub>2</sub> / CO<sub>2</sub> / Air

#### Application examples

- H<sub>2</sub> in N<sub>2</sub>: atmosphere in metal heat treating furnaces
- H<sub>2</sub> in cooling systems for generators
- H<sub>2</sub> in hydrocarbon streams
- H<sub>2</sub> in ammonia synthesis gas
- H<sub>2</sub> in methanol synthesis gas
- CO<sub>2</sub> in methane
- N<sub>2</sub> in methane
- CO<sub>2</sub> in biogas
- CH<sub>4</sub> in biogas
- Purity monitoring of argon, hydrogen, nitrogen and helium

