Gas Sensor

A gas sensor (or gas detector) detects the presence and concentration of gases in the air. MQ-series sensors (e.g., MQ-2, MQ-3, MQ-7) are popular for detecting gases like methane, propane, alcohol, carbon monoxide, and more.

Working Principle:

The sensor consists of a heating element and a sensor electrode. When gases are present, they react with the sensor surface, causing a change in resistance, which is then converted into a readable signal.

Types:

- MQ-2: LPG, smoke
- MQ-3: Alcohol
- MQ-7: Carbon Monoxide
- MQ-135: Air quality

Applications:

- Gas leak detection
- Indoor air quality monitoring
- Breath analyzers
- Safety and industrial control

Advantages:

- Sensitive to a wide range of gases
- Cost-effective
- Easy to use with Arduino and Raspberry Pi

Disadvantages:

- Needs calibration for accuracy
- Preheating time required
- May give false positives due to humidity or temperature

Fig: MQ2 Gas Sensor Module

Pin Diagram:

VCC: This pin is used for a positive voltage supply connection of 5V to power up the module.

GND (Ground): The module is connected to the ground using this pin.

Digital Out (DO): This pin is used to generate the digital output of the module when the threshold value is set with the help of a potentiometer. It gives the digital output either High Or Low based on the presence of gas.

Analog Out(AO): This pin gives the analog output voltage in the range of 0V to 5V, which depends on the gas intensity.