

LamaPLC: MQ Winsen Gas-sensors

Winsen's MQ series gas sensors are low-cost, semiconductor-type (chemiresistive) sensors designed to detect a wide range of gases, including flammable gases, alcohol, and smoke. Each model is tailored to detect specific gases or a range of gases.

- **Operating Principle:** The sensors use a sensitive material (typically SnO₂ semiconductor) and a heating element. The sensor's conductivity varies with air-gas concentration, enabling measurement using a simple voltage divider.
- **Voltage:** They operate on a standard 5-volt DC power supply.
- **Low Cost:** A major advantage is their affordability, making them popular for a wide variety of civil and industrial applications, including smart homes and IoT projects.
- **“Burn-in” Time:** A “burn-in” period of 12 to 24 hours is often recommended to improve measurement accuracy.

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| <p>G</p> <p>smoke LPG (liquefied petroleum gas) propane hydrogen</p> | <p>Winsen MQ-2</p>  | <p>Flammable gas concentration: 300 .. 10'000ppm</p> <p>Heater Resistance; RH: 29Ω ±3Ω@room tem.□ Heater consumption; PH: ≤950mW Sensitivity;S: Ro(in air) / Rs (2000 ppm C₃H₈) ≥ 5 Output Voltage;Vs: 2.5V□4.0V□in 2000 ppm C₃H₈□ Concentration Slope;α: ≤0.6 (R3000 ppm / R1000 ppm C₃H₈)</p> |
| <p>G</p> <p>alcohol (C₂H₅OH)</p> <p>Small sensitivity: Benzine gas</p> | <p>Winsen MQ-3</p>  | <p>Detecting concentration scope□0.05 mg / 10 mg/L Alcohol</p> <p>Sensing Resistance: 1 MΩ - 8 MΩ (0.4 mg/L alcohol)</p> |
| <p>G</p> <p>Methane CH₄ Natural gas LNG</p> <p>Small sensitivity: Alcohol Smoke</p> | <p>Winsen MQ-4</p>  | <p>Detecting concentration scope□200-10'000ppm CH₄, natural gas</p> <p>Sensing Resistance: 10KΩ- 60KΩ (1000ppm CH₄)</p> |
| <p>G</p> <p>LPG Iso-butane Propane</p> <p>Small sensitivity: Alcohol Smoke</p> | <p>Winsen MQ-5</p>  | <p>Detecting concentration scope: 200-10,000ppm LPG, LNG, Natural gas, Iso-butane, Propane, Town gas</p> <p>Sensing Resistance: 10KΩ- 60KΩ (5000 ppm methane)</p> |

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| <p>G</p> <p>Town gas Natural gas LPG LNG Iso-butane Propane</p> <p>Small sensitivity: Alcohol Smoke</p> | <p>Winsen MQ-6</p>  | <p>Detecting concentration scope 200-10'000ppm LPG ,iso-butane, propane, LNG</p> <p>Sensing Resistance: 10KΩ- 60KΩ (10'00ppm LPG)</p> |
| <p>G</p> <p>CO</p> | <p>Winsen MQ-7</p>  | <p>Detecting concentration scope over 300 ppm CO (Carbon Monoxide)</p> <p>Sensing Resistance: 2KΩ- 20KΩ (100 ppm CO)</p> |
| <p>G</p> <p>H₂</p> <p>Small sensitivity: Alcohol LPG cooking fumes</p> | <p>Winsen MQ-8</p>  | <p>Detecting concentration scope 100-10000ppm Hydrogen (H₂)</p> <p>Sensing Resistance: 10KΩ- 60KΩ (1000 ppm H₂)</p> |
| <p>G</p> <p>CO Methane CH₄ LPG</p> | <p>Winsen MQ-9</p>  | <p>Detecting range</p> <p>20 ppm .. 2000 ppm carbon monoxide 500 ppm .. 10'000 ppm methane CH₄ 500 ppm .. 10'000 ppm LPG</p> <p>Sensing Resistance: 2KΩ- 20KΩ (100 ppm CH₄)</p> |
| <p>G</p> <p>ozone</p> | <p>Winsen MQ-131</p>  | <p>-</p> |
| <p>G</p> <p>NO_x Ammonia NH₃ alcohol Benzene smoke CO₂</p> | <p>Winsen MQ-135</p>  | <p>Detecting range</p> <p>10 ppm .. 300 ppm Ammonia NH₃ 10 ppm .. 1000 ppm Benzene 10 ppm .. 300 ppm Alcohol</p> <p>Sensing Resistance: 30KΩ- 200KΩ (100 ppm Ammonia NH₃)</p> |

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|  Ammonia NH ₃ | Winsen MQ-137  | Detecting range 5 ppm .. 500 ppm Ammonia NH ₃ |
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Arduino

Interfacing the **MQ-135** air quality sensor with an Arduino can be done either by reading raw analog signals or by using a dedicated library to obtain calibrated PPM (parts per million) readings.

Arduino wiring

| MQ-135 | Pin | Arduino Pin | Description |
|-----------|---------------|--|-------------|
| VCC | 5V | Power supply (the sensor has a built-in heater) | |
| GND | GND | Ground | |
| AOUT / AO | A0 | Analog output (voltage level based on gas concentration) | |
| DOUT / DO | D2 (Optional) | Digital output (goes high/low based on threshold) | |

Arduino code

This code provides a raw reading from 0 to 1023, which is useful for basic threshold detection (e.g., triggering a fan or an alarm).

```
int sensorPin = A0; // Select the input pin for MQ-135

void setup() {
  Serial.begin(9600); // Initialize serial communication
}

void loop() {
  int sensorValue = analogRead(sensorPin); // Read analog value (0-1023)
  Serial.print("Raw Air Quality Value: ");
  Serial.println(sensorValue);
  delay(1000); // Wait 1 second for next reading
}
```

}

MQ, MQ-2, MQ-3, MQ-4, MQ-5, MQ-6, MQ-7, MQ-8, MQ-9, MQ-131, MQ-135, MQ-137, Winsen, Gas-sensor, sensor, arduino, code, alcohol, C₂H₅OH, Benzine gas, smoke, LPG, propane, C₃H₈, hydrogen, H₂, methane, CH₄, Iso-butane, Town gas, Ammonia, NH₃

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