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| --- | --- | --- | --- | --- | --- |
|  | **Photoele-ctric Sensors** | **Ionization Sensors** | **Gas Sensors** | **Heat Sensors** | **Dual Sensors** |
| **Technolo-gy Used** | IR LED and Photodiode | Radioact-ive Material | Ionization Element | Temperature Sensors | Photoelec-tric & Ionization |
| **False Alarm from Minor Fire (candles, etc.)** | Unlikely | Likely | Unlikely | Unlikely | Likely |
| **Smolder-ing Fire Detection** | Fast | Slow | Fast | Slow | Fast |
| **Flaming Fire Detection** | Fast | Fast | Fast | Slow | Fast |
| **Best Operation-al Use** | Large Space, Smoldering Fire | Large space, Flaming fire/little smoke | Flaming Fire, Smoldering Fire | Small Space, rapid burning high heat fire | Large Space, Smoldering and Flaming Fire |
| **Recom-mended by NFPA** | Yes | No | No | No | No |

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|  | **MQ-2 Sensor** | **MQ-7 Sensor** | **MQ-9 Sensor** | **MQ309A Sensor** |
| **Gas Detected** | General Combustible Gas | Carbon Monoxide (CO) | Carbon Monoxide (CO) & Combustible Gas | Carbon Monoxide (CO) & Flammable Gas |
| **Circuit Voltage** | 5V +/- 0.1 | 5V +/- 0.1 | 5V +/- 0.1 | Less than or equal to 6V |
| **Heating Consumption** | Less than 800 mW | About 350 mW | Less than 340 mW | - |
| **Preheat Time** | At least 24 hours | At least 48 hours | At least 48 hours | At least 48 hours |

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|  | **ATmega8 Microprocessor** | **ATmega328 Microprocessor** | **ATmega1280 Microprocessor** |
| **CPU Type** | 8-bit AVR | 8-bit AVR | 8-bit AVR |
| **Performance** | 16 MIPS at 16 MHz | 20 MIPS at 20 MHz | 16 MIPS at 16 MHz |
| **Flash Memory** | 8 KB | 32 KB | 256 KB |
| **SRAM** | 1 KB | 2 KB | 8 KB |
| **EEPROM** | 512 Bytes | 1 KB | 4 KB |
| **Pin Count** | 28-pin PDIP, 32-pin TQFP, and 32-pad QFN/MLF | 28-pin PDIP, MLF, 32-pin TQFP, MLF | 100-pin TQFP, 100-ball CBGA |
| **Maximum Operating Frequency** | 16 MHz | 20 MHz | 16 MHz |
| **Maximum I/O Pins** | 23 | 26 | 86 |
| **External Interrupts** | 2 | 2 | 8 |
| **Ultra-Low Power Consumption (Active Mode)** | 4 MHz, 3V: 3.6 mA | 1 MHz, 1.8V: 0.2 mA | 1 MHz, 1.8V: 500 uA |