Application Spotlight

Residential Air Purifiers and Fresh Air Machines

Residential air purifiers and fresh air machines are are used to filter out particles in the air. They are typically used in apartments and homes in areas of the world where outdoor pollution is excessive. Home occupants use air purifiers to provide a healthier living space by cleaning the air and viewing other air quality information.

Technology Used

Air purifiers use two primary technologies to clean particles from the air-paper filter and iconic air cleaning technology. Iconic air cleaning technology is where dust particles are electrically charged and stick to the metal filter. It is generally thought that paper filters work better, but they do rely on being replaced. Some products are considered "Smart" with IOT and app capability.

Sensors Used

Dust Sensors - Measure fine particulates in the air, typically called PM2.5 and PM10 (where PM refers to the particle size). Manufacturers use dust sensors to show the effectiveness of their purification product. Dust sensors can also be used to automatically turn the air purifier on and off. The sensors have a built-in fan to move air across the optical path.

CO_2 and VOC Sensors - Often built into higher end products to provide further air quality information. When outdoor air pollution is high, residents shut all windows and vents. This causes CO_2 and VOC's to increase, resulting in poor indoor air quality. A warning can be shown to advise the occupant(s) of the need to introduce fresh air.

Relative Humidity & Temperature Sensors - Excessively dry air can lead to respiratory and sinus issues, and excessively wet air can cause condensation and potential health damaging mold.

Sales Strategy and Market

The smart air purifier market will register a CAGR of almost 14% by 2023. *Source Dublin, March 28, 2019 (GLOBE NEWSWIRE) -- The "Global Smart Air Purifier Market 2019-2023.*

Exposure to air-contaminating particles, such as dust, dander and bacteria, may cause respiratory problems. Indoor burning of solid fuels has been identified as one of the reasons for pollution-related diseases.

The major reason behind this is the burning of fossil fuels, such as coal, wood, charcoal, dung and crop wastes for cooking, heating and lighting. The significant increase in the level of air pollution across the globe increases the demand for air purifiers.
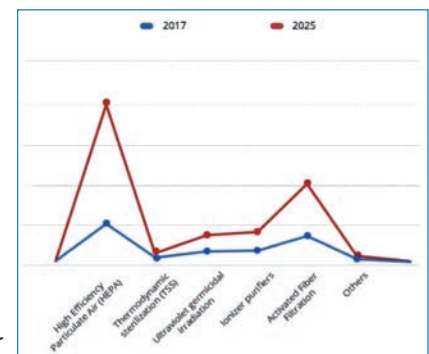
Smart air purifiers have proven to be one of the efficient devices to control air pollution in residential and commercial spaces, as they automatically analyze air quality and operate with the required intensity to clean the impure air. To prevent the occurrence of diseases, air purifiers are being installed in homes and offices, which, in turn, is driving sales of smart air purifiers.

To learn more about applicable Telaire products, click on the links below:

Dust Sensor - Telaire SM-UART-04L

CO_2 - Telaire T6713

VOC   - Telaire MiCS-VZ-89TE

RH/T - Telaire ChipCap 2

Carbon Dioxide (CO$_2$) Sensor

The Telaire T6703 is specifically designed for high volume OEM's. The T6703 Series is available in 2 ranges: 0-2000 ppm and 0-5000ppm (-5K). The simple interface and 5V input and I^{2}C output allows for quick and simple integration. The T6703 is the smallest Non-Dispersive Infrared (NDIR) CO$_2$ Sensor of this type on the market. NDIR sensors out-performs electrochemical sensors in accuracy, repeatability and longevity.

T6703 has patented ABC Logic™, and Telaire warranties the calibration for life.

Telaire is the largest manufacturer of NDIR CO$_2$ Sensors in the world with the capacity to expand production quickly and easily at its Tijuana, Mexico, facility.

With its unrivaled quality and production systems, Telaire invites OEM's to visit its manufacturing facility.

Particulate Dust Sensor

Telaire SM-UART-04L is a PM2.5 laser-based sensor that detects dust particle concentration in air by using an optical sensing method. A laser light emitting diode (LED) and a photo sensor are optically arranged in the device. The photo sensor detects the reflected laser LED light by dust particles in air. The dust sensor can detect small particles from large house dust by the pulse pattern of the signal output.

Telaire's state-of-the-art dust laboratories, located in Shanghai and Changzhou, China, have developed propriety techniques for calibration that provide for consistent accuracy and repeatability.

The SM-UART-04L has small package with built-in fan allowing simple and easy integration for OEM's.

Humidity & Temperature Sensor

The Telaire ChipCap® 2 offers the most advanced and cost-effective humidity and temperature sensing solution for virtually any type of application.

A capacitive polymer sensor chip and a CMOS integrated circuit with EEPROM are integrated into one embedded system in a reflow solderable SMD package.

Individually calibrated and tested, ChipCap 2 performs at ±2% from 20% to 80% RH (±3% over entire humidity range), and is simple and ready to use without further calibration or temperature compensation.

ChipCap 2 provides linear output signals in various interfaces to meet specific customer requirements:

- Digital I^{2}C interface
- Pulse Density Modulated (PDM) convertible to analog signal
- Alarm function for preset control at min/max humidity
- Also available as a Single In-line Package (SIP) module allowing for fast, simple field replacement and faster response.
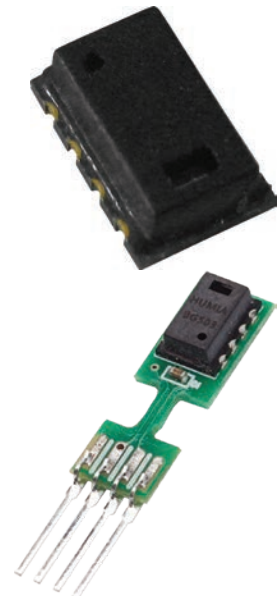
VOC Sensor

The Telaire MiCS-VZ-89TE Integrated Sensor Module combines state-of-the-art MOS sensor technology with intelligent detection algorithms to monitor VOC variations in confined spaces, such as meeting rooms and vehicle cabins.

The dual signal output can be used to control ventilation on-demand, saving energy and reducing cost-of-ownership.

- Calibration-free
- Low power
- Wide VOC detection range
- High sensitivity
- High resistance to shocks and vibrations
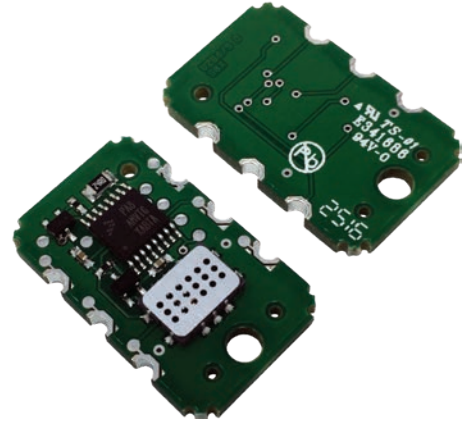
AAS Advantage

Telaire products have been at the forefront of Carbon Dioxide (CO_2) sensing technology for the last 28 years and are the originators of the maintenance free CO_2 infrared sensor.

Telaire has over 35 technology patents including ABC Logic™ and warrants single wavelength sensor calibration for the life of the sensor.

Amphenol Advanced Sensors is a trusted OEM partner providing temperature, humidity, pressure, CO_2 and dust sensors to solution providers in the HVAC, automotive, industrial and healthcare markets.

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