

# **Humidity Sensors Market ? Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Product (Relative {Capacitive & Resistive} and Absolute {Solid Moisture Sensors & Mirror-Based Dew/frost}), By Type (Digital & Analog), By Application (Automotive, Industrial, Healthcare, Residential, Agriculture and Others), By Region & Competition, 2021-2031F**

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## **Abstracts**

The Global Humidity Sensors Market is projected to expand from USD 7.64 billion in 2025 to USD 12.82 billion by 2031, reflecting a compound annual growth rate of 9.01%. Humidity sensors are electronic devices engineered to detect and measure water vapor levels in gases or the atmosphere, translating these physical readings into electrical signals for accurate monitoring and system regulation. This market is chiefly driven by the intense demand for energy-efficient HVAC systems in contemporary infrastructure, alongside the vital requirement for moisture control in pharmaceutical and automotive manufacturing to guarantee product safety. These drivers represent enduring operational necessities rather than fleeting technological fads, underpinned by strict regulatory compliance. To illustrate this industrial demand, the Air-Conditioning, Heating, and Refrigeration Institute reported that total combined shipments of central air conditioners and air-source heat pumps in the United States rose by 11.8 percent in 2024, highlighting the strong growth of the hardware ecosystem dependent on these environmental sensing components.

However, a significant barrier that could obstruct market growth is the technical complexity associated with sustaining long-term sensor stability within harsh

environments. The tendency of sensing elements to drift when subjected to chemical contaminants or severe temperature fluctuations necessitates frequent, expensive recalibration. This issue creates a financial and operational hurdle that limits wider adoption in price-sensitive industrial applications.

### **Market Driver**

A pivotal driver for the market is the rapid uptake of humidity sensors within Electric Vehicle (EV) Battery Management Systems, which is essential for preventing condensation that could lead to electrical shorts and battery pack corrosion. Automotive manufacturers are increasingly embedding these components to track internal moisture levels, thereby safeguarding the durability and safety of high-voltage systems. According to the International Energy Agency's "Global EV Outlook 2024" published in April 2024, global electric car sales reached nearly 14 million in 2023, signaling a massive rise in the production of platforms that require automotive-grade environmental monitoring. This sector-specific growth corresponds with wider component demand; the Semiconductor Industry Association noted that global semiconductor industry sales hit \$149.9 billion in the second quarter of 2024, reflecting a strong supply chain supporting sensor manufacturing.

Concurrently, the growth of Smart Home and Building Automation Systems is fueling demand for sensors that facilitate the dynamic regulation of indoor climates and energy consumption. These systems rely on accurate humidity readings to automatically adjust heating and cooling processes, optimizing energy efficiency while shielding infrastructure from moisture-induced issues like mold. As reported by the Department for Energy Security and Net Zero in May 2024, within the "Smart Meter Statistics in Great Britain: Quarterly Report to end March 2024," there were 35.5 million smart and advanced meters functioning in homes and small businesses. This highlights the widespread rollout of connected infrastructure that increasingly integrates or networks with environmental sensing devices for holistic building management.

### **Market Challenge**

The primary impediment to the growth of the Global Humidity Sensors Market is the technical challenge of maintaining long-term stability within rigorous operational settings. When sensing elements encounter chemical contaminants or extreme temperature swings, they often experience signal drift, leading to a degradation in accuracy over time. This instability generates a substantial operational load, as it demands frequent and expensive recalibration to ensure data reliability. For industrial

users, this results in significant ongoing maintenance costs and costly system downtime, effectively increasing the total cost of ownership.

As a result, price-sensitive industries are frequently reluctant to adopt these advanced sensing solutions, which restricts broader market penetration and depresses sales volumes. This reluctance has a direct effect on industry performance metrics. According to the AMA Association for Sensors and Measurement, the sensor industry's revenue declined by ten percent in the third quarter of 2024 compared to the same period the prior year. This contraction highlights how enduring operational hurdles, such as the financial pressure resulting from stability concerns and elevated maintenance requirements, can inhibit growth and lead to reduced hardware shipments across the wider sensing ecosystem.

## **Market Trends**

The adoption of Wireless IoT Connectivity Standards, specifically Low Power Wide Area Networks (LPWAN), is transforming the humidity sensor landscape by facilitating remote monitoring across vast industrial and agricultural environments. Unlike short-range consumer protocols, standards like LoRaWAN enable sensors to transmit moisture data over extended distances with very low power usage, removing the necessity for intricate wiring or frequent battery changes in inaccessible areas. This functionality is swiftly broadening the addressable market for humidity sensing beyond conventional HVAC uses into large-scale logistics and outdoor environmental tracking. Semtech Corporation reported in their "Q2 Fiscal Year 2025 Earnings Call Transcript" in August 2024 that net sales for their LoRa-enabled solutions, which support this connectivity architecture, hit \$28.7 million, a 72 percent rise from the previous year, underscoring the spiking demand for long-range connected sensing nodes.

Simultaneously, the convergence of Multi-Parameter Environmental Sensing Modules is simplifying hardware design by combining humidity detection with temperature, volatile organic compounds (VOCs), and particulate matter sensors into unified compact units. This movement toward miniaturized, all-in-one Micro-Electro-Mechanical Systems (MEMS) decreases the physical size and manufacturing complexity for device producers, allowing for the integration of comprehensive environmental intelligence into smaller industrial and portable devices. This transition supports the increasing dependence on integrated sensor suites that offer holistic air quality data rather than standalone measurements. Supporting this rise in integrated sensing solutions, Sensirion Holding AG reported in their "Half-Year Report 2024" in August 2024 that the company achieved consolidated sales of CHF 128.0 million for the first half of the year,

marking an organic revenue increase of 8.9 percent, largely fueled by new business in industrial and automotive sectors employing these advanced sensor modules.

## Key Market Players

Honeywell International Inc.

TE Connectivity Ltd.

Sensirion AG

STMicroelectronics N.V.

Amphenol Advanced Sensors

Texas Instruments Incorporated

Robert Bosch GmbH

Littelfuse Inc.

GE Inspection Technologies

PCE Holdings GmbH

## Report Scope

In this report, the Global Humidity Sensors Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Humidity Sensors Market, By Product

Relative {Capacitive & Resistive}

Absolute {Solid Moisture Sensors & Mirror-Based Dew/frost}

Humidity Sensors Market, By Type

Digital

Analog

### Humidity Sensors Market, By Application

Automotive

Industrial

Healthcare

Residential

Agriculture

Others

### Humidity Sensors Market, By Region

North America

United States

Canada

Mexico

Europe

France

United Kingdom

Italy

Germany

Spain

Asia Pacific

China

India

Japan

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

## **Competitive Landscape**

Company Profiles: Detailed analysis of the major companies present in the Global Humidity Sensors Market.

## **Available Customizations:**

Global Humidity Sensors Market report with the given market data, TechSci Research

*Humidity Sensors Market ? Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Product...*

offers customizations according to a company's specific needs. The following customization options are available for the report:

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