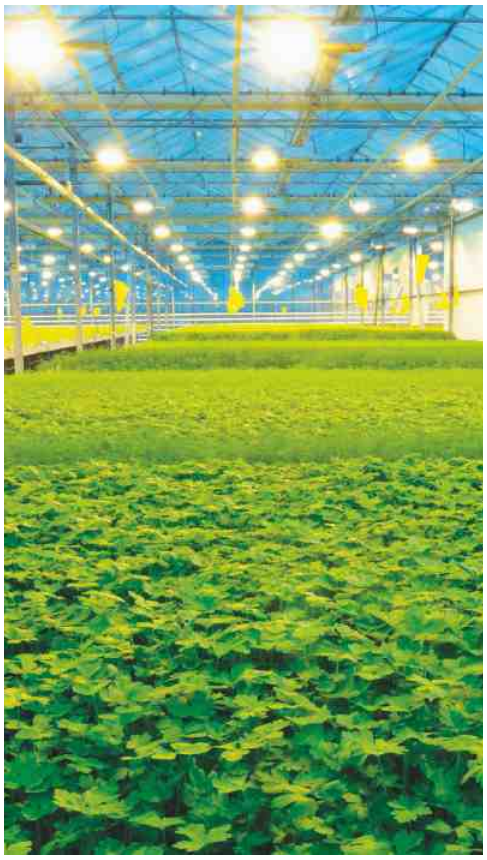
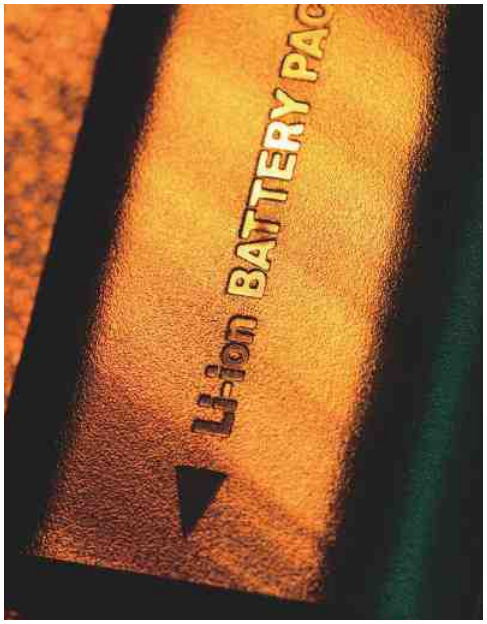
Introduction to Industrial Measurement Applications

AUTOMOBILES, AIRCRAFT & SHIPS / LIFE SCIENCES / FOODS / AGRICULTURE / MANUFACTURING / ELECTRIC POWER / ART GALLERIES & MUSEUMS





Solutions for Industry

VAISALA

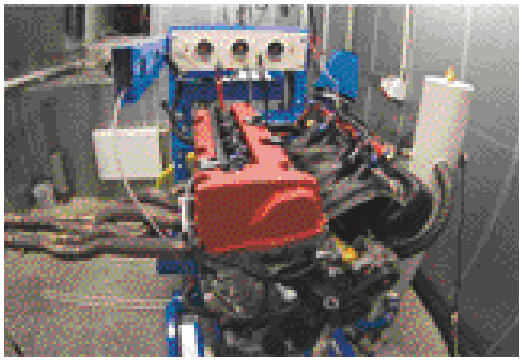
Painting Booths

By adjusting the humidity level in painting booths to the correct level, stable painting of carriages for automobiles, aircraft, or trains can be achieved.

The HMT360 series has been certified as intrinsically safe and explosion proof, so it can be used in explosion proof areas.

HMT360 Series
Intrinsically Safe,
Explosion Proof
Humidity
and Temperature
Transmitters

Engine Benches



Engine test benches are used to perform tests with various humidity levels, temperatures, and atmospheric pressures. We recommend using the PTU300 series, which is capable of measuring all of these using a single device.

PTU300 Series
Combined Pressure,
Humidity and
Temperature
Transmitters

Fuel Cell Evaluation Devices

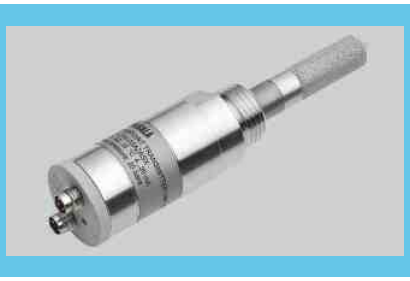
As fuel cell development involves testing with various temperatures and humidity levels, in order to determine the optimal conditions, the insides of evaluation devices can reach high temperatures and high humidity. For such severe environments, we recommend the HMT337, which has a warmed probe against condensation prevention function.

HMT337 Humidity
and Temperature
Transmitters with
a warmed probe.

Lithium Ion rechargeable battery

In lithium ion rechargeable battery, evenly injecting electrolytes between electrode materials enables improvement of battery features and lifespan. As this process is performed in a low humidity environment, we recommend use of DMT143L dewpoint transmitters which are suitable for low dew point industrial monitoring.

DMT143L
Dewpoint
Transmitter



Cleanrooms

The HMT120 and HMT130, with a dust resistant design, are often used for monitoring of humidity levels inside cleanrooms of pharmaceutical manufacturers and semiconductor manufacturers.

HMT120/HMT130
Humidity and
Temperature
Transmitters

Pharmaceutical Manufacturing Facilities

Methanol and other highly flammable solvents are sometimes used in pharmaceutical manufacturing facilities. In such cases, the HMT360 series, with its intrinsically explosion proof structure, is often used.

HMT360 Series
Intrinsically Safe,
Explosion Proof
Humidity and
Temperature
Transmitters

Pharmaceutical Warehouses

In large automated warehouses and pharmaceutical warehouses, the DL2000, which needs no external power source as it uses internal batteries, and the HMT140, which can be connected using Wi-Fi, are often used.

2000 Series Data Loggers that Measure Temperature and Humidity

Multiple Parameter Capable HMT140 Wi-Fi Data Logger

Incubator

In incubators and other test chambers, it is necessary to maintain specific temperatures, CO_2 concentrations, and humidity levels for tests and incubation processes. As such, highly reliable monitoring is necessary.

Across the world, regulatory bodies are reviewing guidelines and developing measures related to processing in the biotechnology field, and the need for reliable measurement solutions is increasing.

GMP251 Carbon Dioxide Probe for High Concentration Measurement for %-level measurements

Plastic Greenhouses

For monitoring humidity levels and temperatures inside plastic greenhouses, we recommend the HMT330 series. The management of CO_2 concentrations is not only important for increasing production, but also for managing the maturity of produce, which is essential to improving quality.

Accurate measurement of CO_2 concentration is difficult in high-humidity environments, and CO_2 measurement values also depend on the temperature. Vaisala's intelligent probes incorporate an internal temperature sensor for compensation of the CO_2 measurement according to ambient temperature. This enables them to accurately measure CO_2 concentrations.

GMP251/252 Carbon Dioxide Probe

HMT330 Series Humidity and Temperature Transmitters

Drying Processes

For environment monitoring in the drying phases of foods, ceramics, and building materials such as wood and gypsum boards, we recommend the HMT337 and the DMT345, which can be used in high temperature and high humidity environments.

In order to prevent condensation caused by falling temperatures when high-temperature drying operations or drying operations (under 100°C) are stopped, we recommend use of a HMT337 warmed probe.

HMT337 Humidity and Temperature Transmitters with a Warmed Probe

DMT345 Dewpoint Transmitters for High Temperature Environments

Compressor Air

The DM70 hand-held dewpoint meter is often used to check whether the dry air emitted by compressors is within the threshold values set for dewpoints.

DM70 Hand-held Dewpoint Meter

Production Facilities & Storage Management

Accurate management of humidity levels in production facilities and product storage locations leads to improved quality control. The DMT340 series dewpoint transmitters, suitable for dry areas, and the HMT330 series, suitable for environments with normal humidity, are often used.

DMT340 Series Dewpoint Transmitters

HMT330 Series Humidity and Temperature Transmitters

Gas Turbines

To improve the efficiency of gas turbines, a hydrometer is necessary for managing the moisture of the intake air. The HMT330 series, which can be used to perform constant monitoring, is often used for this purpose.

HMT330 Series Humidity and Temperature Transmitters

Transformer Oil in Transformers

Transformers are filled with insulation oil, but it is possible to decide the timing and frequency of maintenance by periodically measuring the amount of moisture in the oil and the concentration of gases. In addition, an exploit analysis of insulation oil can make it possible to avoid unexpected sudden failures that are hard to predict.

MHT410 Moisture, Hydrogen and Temperature in Oil Transmitter

Optimus™ DGA Monitor OPT100

MMT330/MM70 Moisture in Oil Transmitter

Moisture in Isolation Gas

In high pressure gas isolation equipment, dried SF6 gas is inserted under high pressure and then the equipment is sealed. However, it is necessary to keep the gas so it contains the minimum amount of water. In addition, as equipment ages there are cases where the amount of water increases. DPT145 is used for monitoring the dewpoint in SF6 gas.

DPT145 Multiple Parameter Transmitter for SF6 Gas

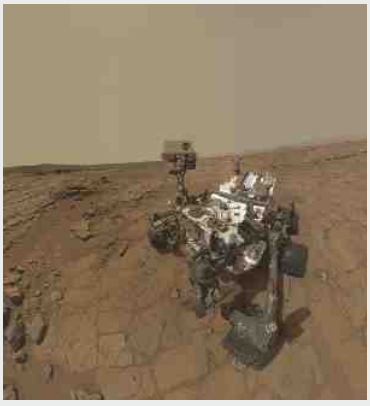
Vaisala sensors are used in a wide variety of fields

Vaisala's atmospheric pressure sensors and humidity sensors are being used in the atmospheric investigation of Mars!

Vaisala's BAROCAP® pressure sensors and HUMICAP® humidity sensors were included in the Finnish Meteorological Institute's design for instruments, and were installed on the NASA Mars exploration rover, "Curiosity," which was launched on November 26, 2011.

Vaisala's sensor technology is being used to accurately measure the atmospheric pressure and humidity levels in the demanding environment of Mars' atmosphere. It is also being used to search for trace evidence that may prove that there used to be water on Mars.

In addition, Vaisala's sensor technology has also been used in the joint Mars investigation plan of the European Space Agency and the Russian Federal Space Agency, "ExoMars". The technology is expected to perform accurate measurement in the very low atmospheric pressure environment of Mars.



Mars Exploration Rover "Curiosity" (Image provider: NASA/JPL-Caltech/MSSS)

Vaisala is contributing to the protection of Leonardo Da Vinci's world-famous Mona Lisa!

Vaisala's instruments are being used to protect one of the world's most famous pieces of art, the Mona Lisa, in the Louvre Museum in Paris, France.

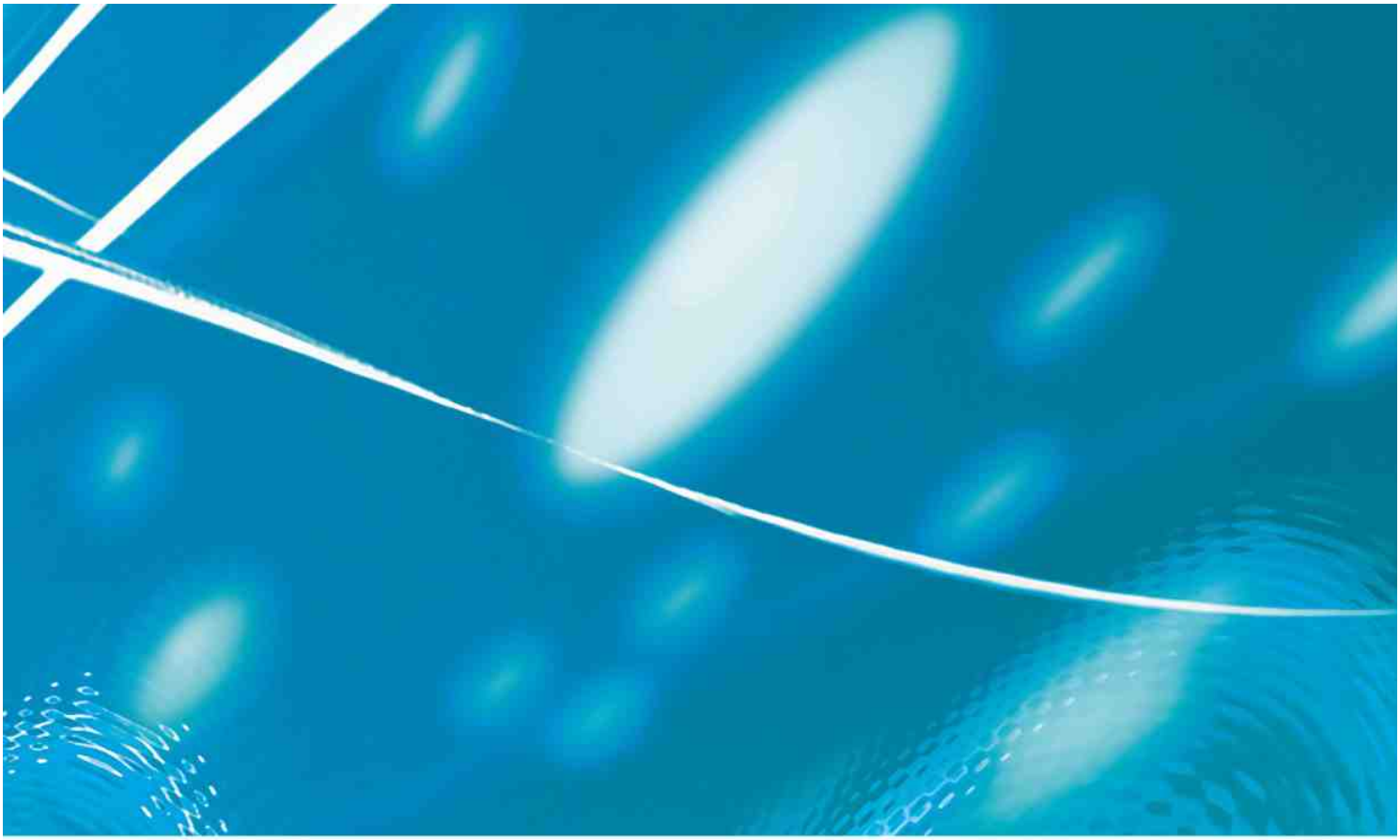
More than 500 years have passed since the Mona Lisa was painted, and it is currently stored in a custom-made glass case. Inside the glass case is an advanced air processing system, which keeps the environment inside the glass case, the surrounding wall, and the wooden stand at a relative humidity of 50% and a temperature of 21°C by circulating the air. There is one Vaisala instrument near the right eye of the Mona Lisa and one near the right hand. These instruments contribute to the protection of the "Mona Lisa by monitoring the humidity level and the temperature inside the glass case.

In the storage and transport of works of art, an environment with a constant humidity level and temperature is prescribed as a contract condition. However, the measuring equipment, the methods, the arrangement locations, and the number of devices vary greatly between art galleries. Management of the humidity levels and temperature in the display rooms of art galleries and museums must be strictly controlled.

Louvre Museum Collection's Mona Lisa

Other Field-Proven Industrial Measurement Products

User Organizations	Usage	Vaisala Product
National Institute for Materials Science (NIMS)	Managing dewpoints inside large-scale super dry rooms for lithium air battery development	DMT152 dewpoint transmitters
Seibu Giken Co., Ltd.	Managing dewpoints of dehumidifiers for dry air ventilation rates	DMT242 dewpoint transmitters
Kanden Engineering Corporation	Measuring moisture in transformer oil during shipping inspections	MMT338 moisture in oil transmitter
Taizhou Yangtze River Bridge (China: World's longest cable stayed bridge)	Monitoring the moisture absorption of the main cable	HMT330 humidity and temperature transmitters



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