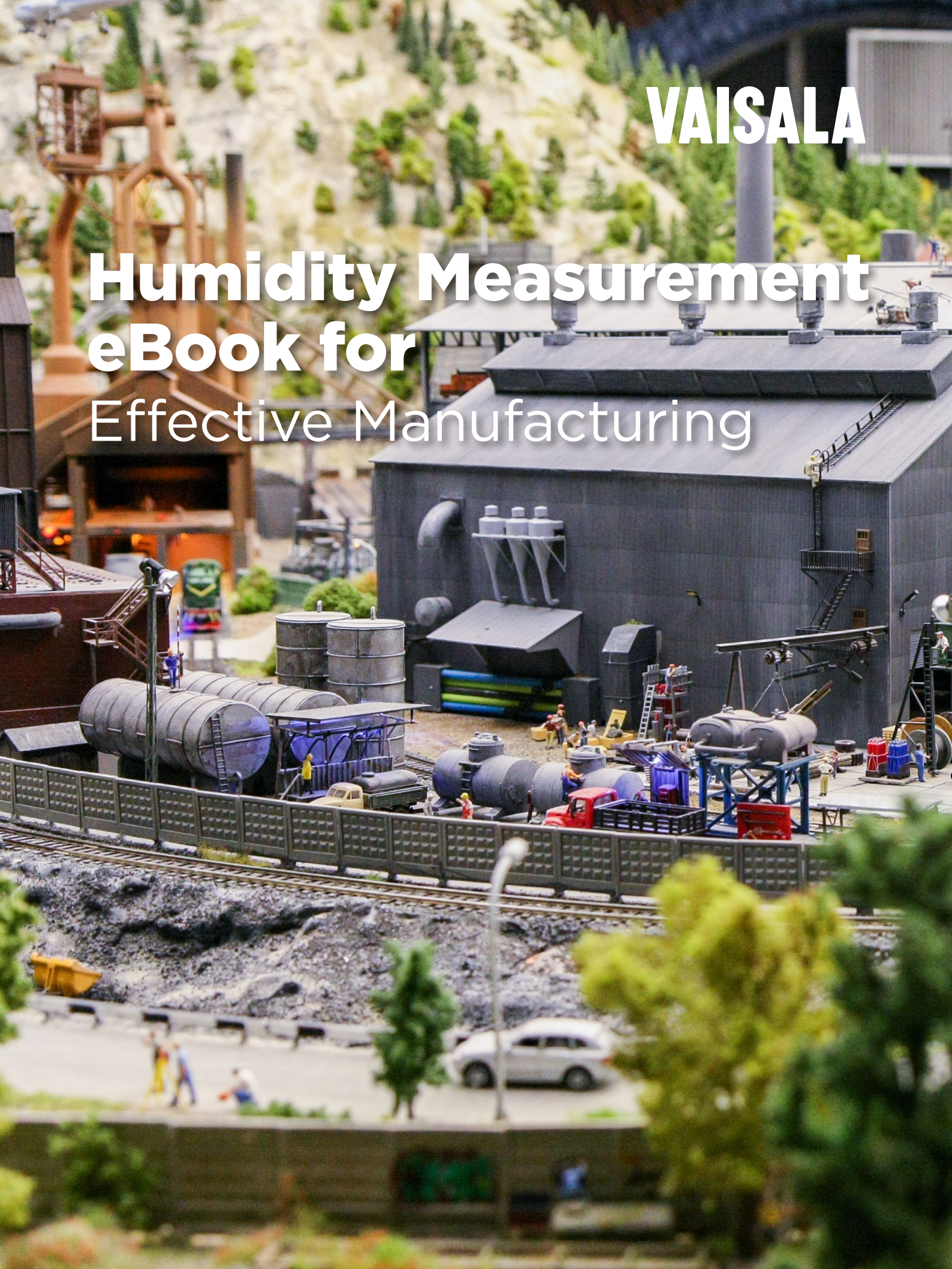
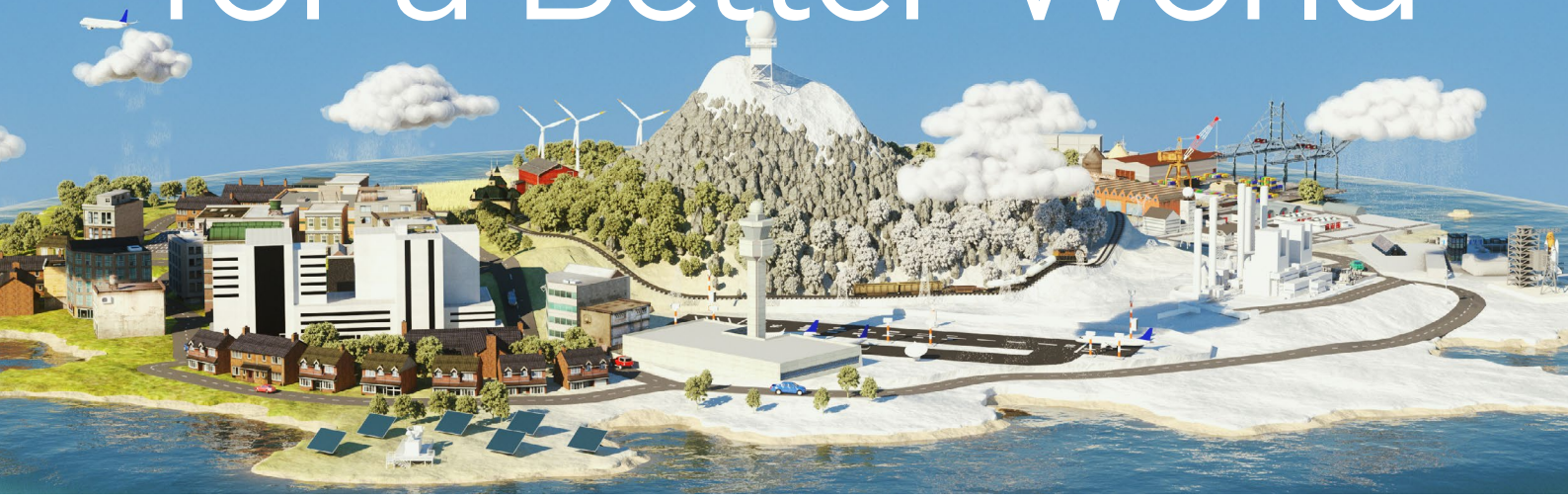


VAISALA

Humidity Measurement eBook for Effective Manufacturing

Meaningful Observations for a Better World



Welcome Colleague! The purpose of Vaisala's Humidity Measurement eBook for Effective Manufacturing is to share humidity theory and practical examples of how measuring humidity, moisture and dew point brings value to different manufacturing processes.

Vaisala is a global leader in industrial and environmental measurement, committed to reliable environmental observations for better decision making, safety and efficiency.

Watch: Vaisala - Future Positive

Explore

LEARN
Humidity Formulas, Calculator & More

WATCH
Videos and Webinars

DISCOVER
Simulation & Technology

MEASURE
Instruments & Applications

EXPERIENCE
Customer Success Stories

INQUIRE
Contact Us

Humidity Formulas

There are various humidity parameters and conversion formulas that you can start using right away. We have created a comprehensive document that makes it easy to get to grips with the essential humidity formulas at your own pace; giving you the confidence and knowledge you need to make your own humidity calculations.

Discover how the different humidity parameters correlate to one another and learn how to make conversions and calculations including:

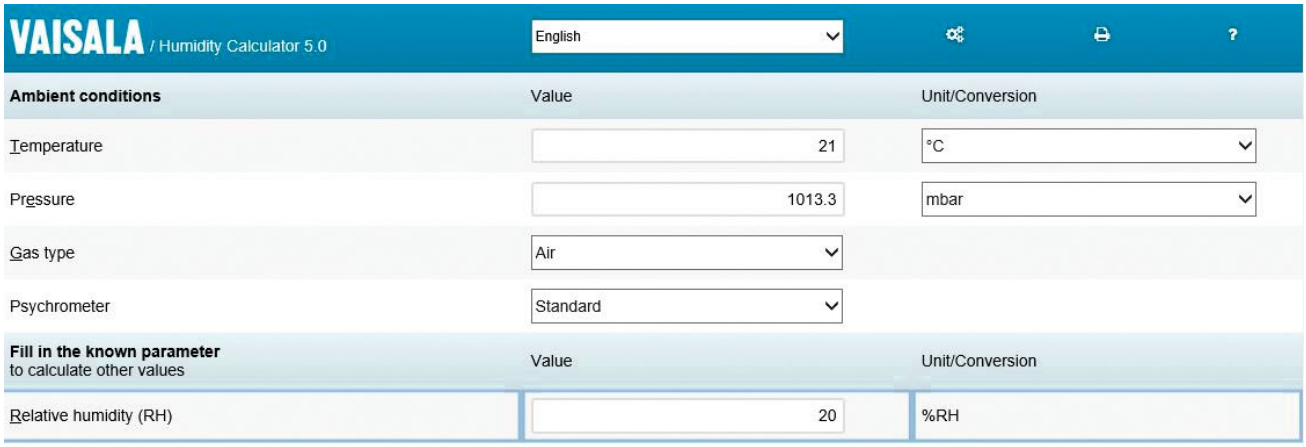
- dew point from relative humidity or at different pressures
- relative humidity from dew point mixing ratio or enthalpy
- absolute humidity and parts per million (ppm)

Open the Humidity Conversion Formulas document

Humidity Calculator

Using your computer or mobile device is an easy and convenient way to make humidity calculations and conversions. The free Vaisala Humidity Calculator lets you calculate several humidity parameters from one known value. You can also do unit conversions and see the effects of changing ambient conditions – like temperature and pressure – on humidity parameters.

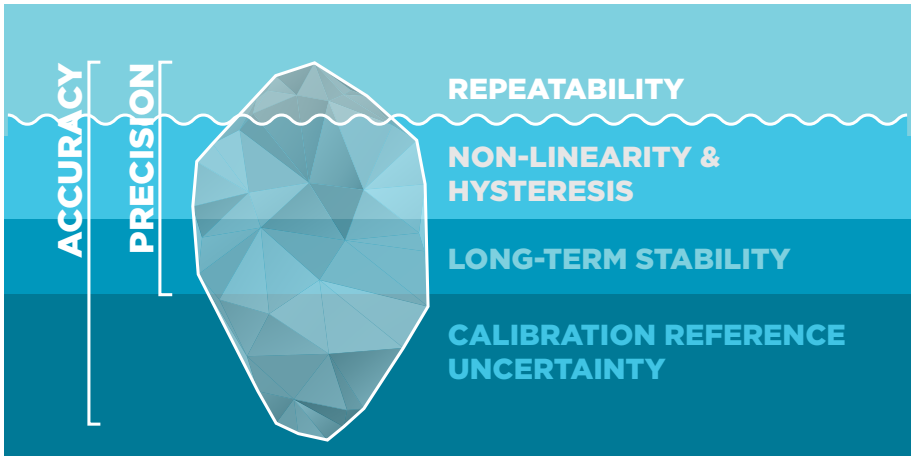
Use the tool online, or bookmark it for offline use. The same tool is optimized also for mobile devices. **Just click to open.**



Measurement Glossary

Glossary	
Measurement accuracy:	Closeness of agreement between a measured quantity value and a true quantity value of a measurand.
Measurement precision:	Closeness of agreement between indications or measured quantity values obtained by replicate measurements. Sometimes erroneously used to mean **measurement accuracy**.
Hysteresis:	A variation in measurement induced by a direction change.
Non-linearity:	A change in measurement sensitivity with regards to the magnitude of the measurand.
Calibration:	The comparison of a measurement value against a reference or calibration standard.
Calibration uncertainty:	The cumulative sum of measurement uncertainty for the calibration reference along the traceability path from the used calibration reference (working standard) up to the top-level reference (primary standard).
Adjustment:	The adjustment of the transfer function against a calibration standard. Adjustment at more than two points along the dynamic range indicates poor linearity of the measurement device.
Metrological traceability:	Property of a measurement result whereby the result can be related to a reference through a documented, unbroken chain of **calibrations**, each contributing to the measurement uncertainty.
Sensitivity:	A relation between the indication of an instrument and the corresponding change in a value of a quantity being measured.
Selectivity:	Independence of a measurement system for changes in other factors than the measurand (environmental variables, chemicals etc).
Resolution:	The smallest change in measured quantity that causes perceptible change in measurement indication. In electronic instruments, the resolution may be affected by analog output stage resolution and scaling.
Stability:	Property of a measuring instrument, whereby its metrological properties remain constant over time.

Learn more and download Understanding Measurement Performance and Specifications



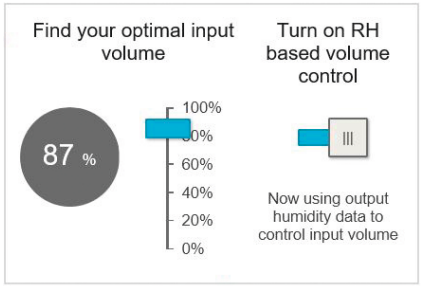
Humidity and Intrinsic Safety

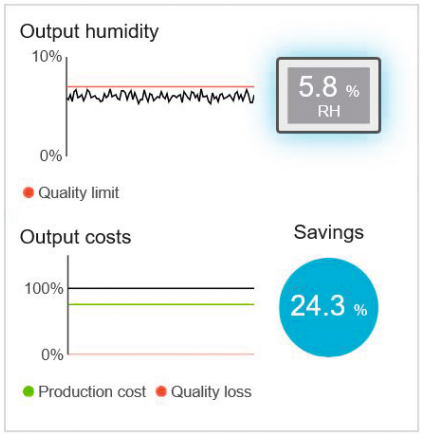
Intrinsic safety (IS) is a concept that is used to prevent electrical equipment from causing explosions in hazardous environments. A hazardous environment is a location where potentially explosive mixtures of gases or fine powders are expected to exist. Electrical equipment has the potential of igniting these mixtures if sparks or high temperatures are generated during the operation of the equipment. In an intrinsically safe system, all of the equipment is designed and installed in such a way that it does not have enough energy to cause ignition of the potentially explosive gas mixture, even in a fault condition.

Learn more and download Intrinsically Safe Instruments Help to Minimize Risks in Hazardous Locations

Drying Simulation

Save energy and costs or increase your yield with the same amount of energy if you are currently over-drying your product. Take a moment to play with our drying simulation to see an example of how using relative humidity-based input volume control may help your drying process.





OPEN SIMULATION

Technology from Vaisala

RELATIVE HUMIDITY

Vaisala's relative humidity measurement is based on the leading HUMICAP® sensor technology.

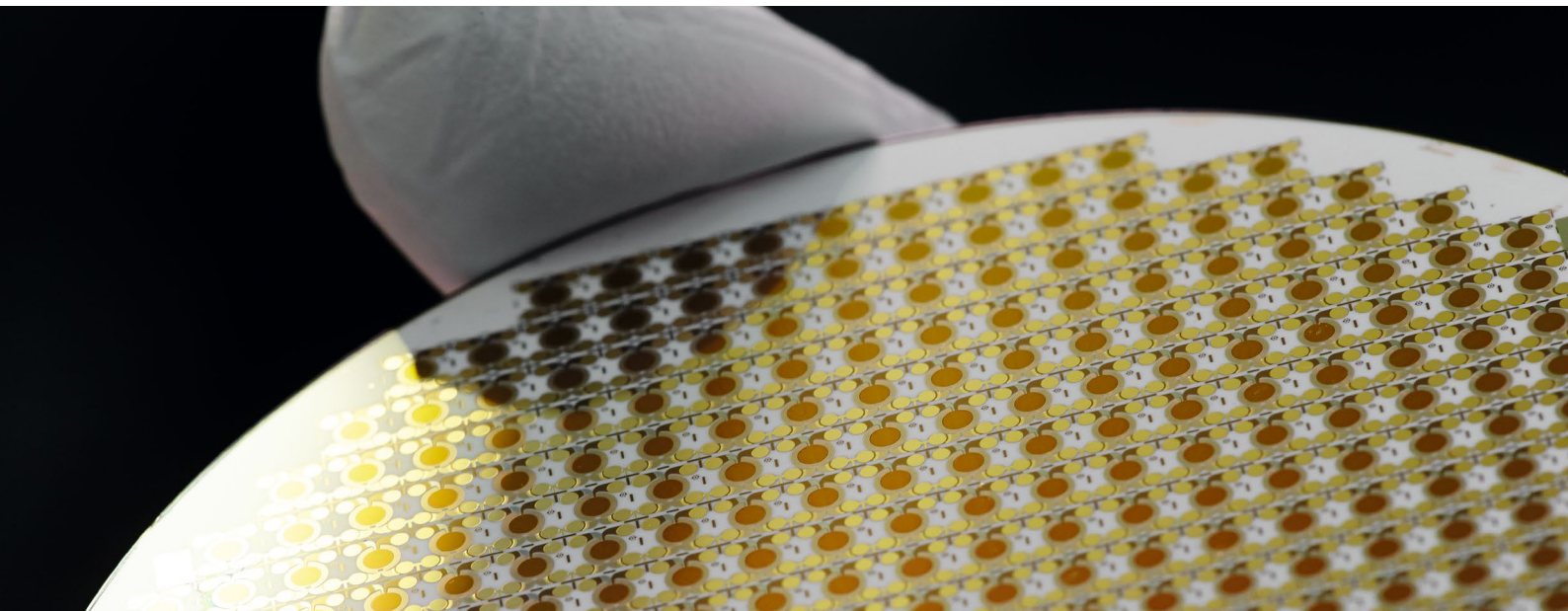
See technology description.

See also different HUMICAP® sensor types here.

DEW POINT

Vaisala's dew point measurement is based on the advanced DRYCAP sensor technology.

See technology description.



Webinars & Video

What is Relative Humidity and How is it Affected?

Watch the webinar

Relative Humidity Best Practices

Watch the webinar

Vaisala HUMICAP® HMT330 Series

Six models for various demanding applications.
Watch the video

Instruments

Vaisala has a wide selection of humidity and dew point measurement instruments that are optimized for different types of applications. See our best-in-class products below.

Vaisala HUMICAP® HMT330 Series
for Normal and High Humidities

Vaisala DRYCAP® DMT340 Series
for Very Dry Applications

Vaisala HUMICAP® HMT360 Series
for Hazardous Environments

Vaisala HUMICAP® MMT330 Series
for Moisture in Oil Measurement

Vaisala Handheld Meters
for Spot-Checking

Vaisala HUMICAP® SHM40
Concrete moisture measurement kit

Dissolved Gas Analysis
monitors for transformers

Vaisala WXT530 Series
Weather Transmitters

viewLinc Environmental Monitoring System
Monitor humidity and temperature wirelessly

SEE MORE

Applications

From power and steel to marine and plastics, most industries can benefit from the monitoring of relative humidity, dew point or moisture in oil. Monitoring helps to ensure the processes are run efficiently, saving energy and securing the end-product quality. Typical applications that benefit from humidity measurement:

Compressed Air

Avoid over-drying the air by measuring dew point.

Construction Material Manufacturing

Measure water vapor in the drying process.

Spray Drying

Control the output humidity to optimize the energy usage.

Metal Heat Treatment Furnaces

Measure dew point in furnace gas.

Lithium Battery Manufacturing

Detect water vapor in the process.

Structural Moisture

Detect moisture in concrete to avoid mold growth and VOCs.

SEE MORE

Mona Lisa Preserved by Vaisala

You probably know of the Mona Lisa, known as La Joconde in French, one of the most popular works of art in the world. You also know that it can be found in the world-renowned Louvre Museum in Paris. But what you may not know is that Vaisala helps preserve the Mona Lisa by measuring the stability of the humidity and temperature environment within its glass vitrine. Read the whole case study.

READ MORE

Vaisala in Space

Why is Vaisala technology utilized in space exploration? Our technology is extremely stable and this is vital due to the extreme environmental conditions that are experienced in space. Vaisala sensors are able to withstand extreme heat and cold and are highly tolerant of shaking and vibration. It is this high level of stability that ensures they can deliver accurate readings of the real changes even on other planets.

READ MORE

At Your Service

Vaisala brings Best-In-Class value to our customers every day. To ensure we continue to understand your needs, we take customer feedback seriously and cater to your specific requests. Our premium manufacturing facility ensures that the instruments we offer meet your most demanding requirements in a wide variety of applications.

The Vaisala experience includes also calibration, maintenance and adjustment with care. Vaisala calibration customers end up with an accurate-as-new product, a certification to prove it and peace of mind. Our Calibration and Premium Care Agreements make it easy for you to take care of your high-quality instruments for years to come.

READ MORE

"Our sales and engineering team is extremely **skilled** and **experienced** and is **always available to help** our customers with optimal solutions for their business needs."

Gerry Ducharme, AMER Controlled Environment Group

Inquire

Our team brings to our customers 100+ years of combined mechanical, chemical, electrical and computer engineering experience.

Vaisala engineers are on hand to assist you with your product or application questions.

CONTACT VAISALA

Measure & Succeed

VAISALA

Please contact us at
www.vaisala.com/requestinfo

www.vaisala.com

Scan the code for more information