

Vaisala Air Quality Monitoring

/ PROTECTING PUBLIC HEALTH THROUGH AIR QUALITY



VAISALA



Monitoring, predicting, and reporting air quality has become a growing need.

Vaisala has been supplying weather instruments for traditional air quality monitoring and research for decades. With new innovative air quality monitoring instruments, Vaisala can now provide comprehensive air quality monitoring combined with weather observations even in complex terrains and urban areas.

Poor air quality kills millions. In areas that experience regular and persistent air pollution, these conditions influence everyday life. Whether canceling travel to work or school, using protective face masks, or planning outdoor events, people make decisions that affect their lives based on the accuracy and reliability of air quality information. This information is not complete without considering the atmospheric conditions using local and regional weather observations.

Air Quality Monitoring

The amount of air pollution depends on meteorological conditions. To a certain extent nature can improve or worsen air quality. Wind mixes and dilutes the gases. Rain suppresses dust and other substances to the ground. Under weak wind conditions air pollution and particulates can accumulate causing increased air pollution. Rain can also pollute the environment when mixed with high levels of sulfur dioxide and nitrogen oxides causing acid rain.

That is why simply measuring air pollution alone does not give a complete picture. Meteorological conditions such as temperature, rain, and humidity must be measured to understand why air quality can vary from day to day.

Addressing a Worldwide Health Risk

It is impossible for governments and air quality monitoring agencies to formulate effective policies and understand the causes of pollution without daily air quality monitoring. The ability for these organizations to comprehensively estimate urban air pollution improves their decision making and assists in the implementation of preventive actions to reduce emissions.

Denser Monitoring Networks Improve Accuracy

Ambient air monitoring has typically been done using fixed ground-based air monitoring stations spread out over a large area. However, climate, weather conditions, and pollution

levels can differ significantly within a small area creating the need for more localized monitoring.

In the past, the high cost of these stations made it difficult to establish monitoring networks dense enough to give a detailed picture of local areas.

Now, governments and monitoring agencies have a cost-effective solution for creating extensive and dense monitoring networks.

Vaisala Air Quality Transmitters AQT410 and AQT420 are easy to install, deploy, and maintain. By combining these transmitters with Vaisala's Multi-Weather Sensor WXT530 agencies can better predict air quality in advance.



Weather conditions impact air quality.

Building Comprehensive Air Quality Monitoring Networks



● Reference-level air quality monitoring stations

Reference-level regulatory air quality monitoring stations only represent a specific area. Pollution levels can differ significantly from one area to another because of the surrounding environment and weather conditions.



◆ Vaisala Air Quality Transmitters

Supplementing existing networks with cost-effective Vaisala Air Quality Transmitters enables denser networks that increase the number of measurement points. Data is sent wirelessly to a web-based interface improving the access to real-time air quality information that can be used for alerts and warnings.



◆ Vaisala WXT Multi-Weather Sensors ■ Vaisala Ceilometers

Vaisala's Air Quality Transmitters can seamlessly connect to the WXT Multi-Weather Sensors for a comprehensive view of the conditions that affect air quality. Further, when the height of the mixing layer of the atmosphere is observed using the Ceilometer CL31 or CL51, agencies can better estimate when the pollution will be dispersed.

Vaisala Air Quality Transmitters

AQT410
and
AQT420



Vaisala WXT Multi-Weather Sensors

WXT536



Vaisala provides the latest technology for air quality monitoring, as well as measuring atmospheric weather conditions relevant to monitoring, estimating, and forecasting air quality.



Better quality air means
a better quality of life.

Air Quality Transmitters and Multi-Weather Sensors Improve Air Quality Monitoring and Prediction



Vaisala Air Quality Transmitters AQT410 and AQT420 can augment existing monitoring networks and can be used where installing a large air monitoring station is impractical.

- Cost effective
- Easy to install, deploy, and maintain
- Identifies and tracks daily level of the most common gaseous pollutants: NO₂, SO₂, CO, and O₃
- PM_{2.5} and PM₁₀ can be measured with AQT420



Air quality is heavily dependent on the weather and can be predicted a few days in advance based on the weather forecast. Vaisala's WXT530 Multi-Weather Sensors measure up to six essential weather parameters to integrate with air quality measurements to improve accuracy.

- Wind speed and direction
- Temperature
- Humidity
- Precipitation
- Barometric pressure



Ceilometers

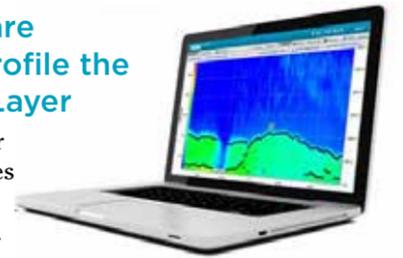
Vaisala's Ceilometers CL31 and CL51 provide automatic monitoring of planetary boundary layer height, also known as the mixing layer height.

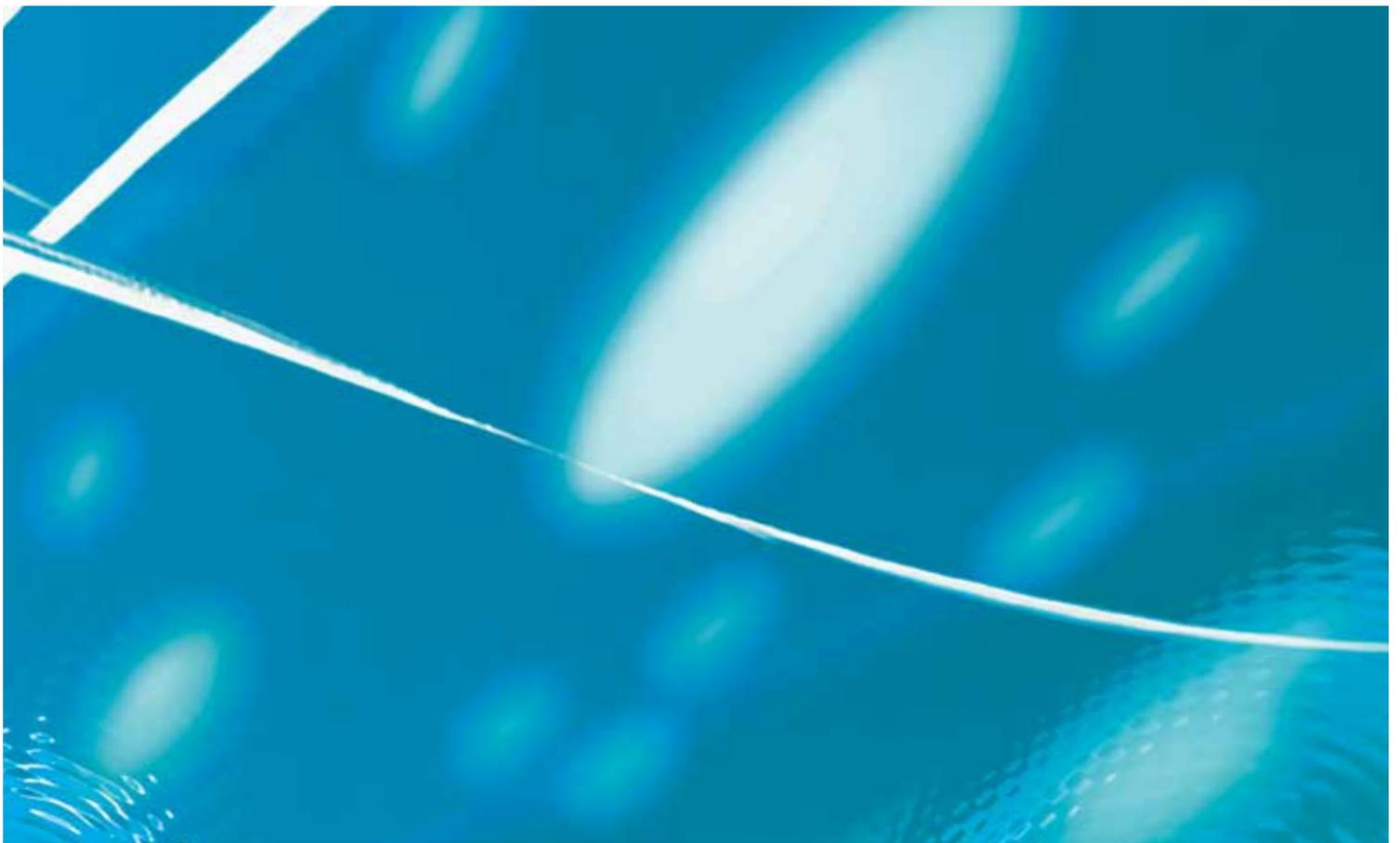
- Eye-safe, compact, and robust lidar system designed for unattended operation.
- Continuously monitors the vertical profile of aerosols and the boundary layer.
- Monitoring the layer height is critical for estimating the nature, transformation, and dispersion of air pollutants.

BL-View Software Continuously Profile the Critical Mixing Layer

Vaisala Boundary Layer View (BLVIEW) provides 24/7 visualization of the mixing layer height.

- An independent data collection, storage, analysis, and reporting tool designed to be used with the Vaisala Ceilometers CL31 and CL51.
- New automatic algorithm for online retrieval of boundary layer depth and additional residual structures including ideal boundary layer diurnal evolution and all situations involving clouds, fog, and precipitation.





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