



Keep the noise down, please

Vaisala weather instruments in environmental noise monitoring



eBrüel & Kjaer Sound & Vibration Measurement A/S is the world-leading manufacturer and supplier of sound and vibration solutions. Today, Brüel & Kjaer has 900 employees and sales offices in 55 countries. The customers are from a wide range of industries including automotive, aerospace, consumer goods and telecommunications, as well as national government agencies.

Brüel & Kjaer chose the Vaisala Weather Transmitter WXT510 product line as the weather measurement instruments for its new generation of environmental noise monitoring terminals used in continuous noise monitoring.

Brüel & Kjaer and Vaisala are both well-established companies within the airport environment. Brüel & Kjaer has 40 years of experience in producing noise monitoring solutions for airports. The cooperation between Brüel & Kjaer and

Vaisala has been ongoing for almost a decade. Before the weather transmitter was introduced on the market, Brüel & Kjaer have been installing Vaisala weather stations at airports.

In addition to airports, the problem of increasing noise exposure has been realized in many cities. Noise levels are monitored and calculated in bigger cities in order to understand the extent of the actual noise problem. Many European cities are supplied with noise monitoring equipment; several have chosen Brüel & Kjaer's solutions.

The Vaisala Weather Transmitter WXT510 and WINDCAP® Ultrasonic Wind Sensor WMT50 have proven to be optimal weather sensors for both airport and urban noise monitoring applications.

Airport noise monitoring

People living around airports are exposed to constant noise from aircraft takeoffs

◀ *The Vaisala Weather Transmitter WXT510.*

and landings. The demand for quieter airports has led to strict legislation relating to airport noise management. In some countries, airport noise monitoring has been made compulsory.

Flight tracking is possible by interfacing airport radar information with a noise monitoring system. The aircraft and airlines that violate regulations can be identified. By monitoring airport noise, we learn how to minimize the noise impact caused by aircraft.

Urban noise monitoring

Noise is a nuisance especially in dense urban areas. The major urban sources of noise are road and railway traffic, construction-sites, leisure activities and industry. Our living comfort is reduced when we are exposed to high noise levels.

Traffic regulation, low noise pavements and noise barriers are examples of noise level reduction measures. As these investments are very expensive, it is important to pinpoint the worst noise areas precisely, before investing in noise protection. The best tools for this identification are noise calculations and measurements.

EU Environmental Noise Directive

In order to harmonize the noise protection programs that vary country by country, the EU has approved the EU Environmental Noise Directive 2002/49/EC. The directive covers transportation and industrial noise. It calls for noise maps and action plans to be made for bigger cities (populations > 100,000), major roads (> 3 million vehicles a year), major railways (> 30,000 trains a year) and major civil airports (> 50,000 operations a year). Noise maps show the noise parameters of each source of noise at a height of four meters over the ground. The first maps for major areas are required by mid 2007 and action-plans a year after.

Weather measurement in noise monitoring

The most important factors affecting noise propagation are the type of noise source, distance from source, atmospheric absorption, wind, temperature and temperature gradient, obstacles such as barriers and buildings, ground absorption, reflections, humidity, and precipitation.

Wind speed is the most important weather parameter in noise monitoring.

The compact and solid design ensures that the maintenance requirement of the Vaisala sensors is minimal.



*The Vaisala WINDCAP®
Ultrasonic Wind
Sensor WMT50.*

Over 5m/s winds create noise, and thus affect the noise level detected by a microphone. If the wind is higher than 5m/s, the noise monitoring terminals must report a possible error source in the noise measurement results.

Air pressure is another important parameter in airport noise monitoring. Because aircraft communicate their altitude in air pressure units, the real aircraft altitude can be calculated using the Vaisala Weather Transmitter WXT510 ground level air pressure.

Noise monitoring terminals

Brüel & Kjaer's environmental noise management solutions uniquely link calculated and measured noise data together. The concept includes noise monitoring terminals (NMT) with an outdoor microphone, a server and a portfolio of calculation software. The noise management software has an advanced functionality for the handling of measured noise data, plus weather parameters from integrated weather sensors. The software is prepared for the support of web clients for easy access from any PC. It is possible to connect a number of Brüel & Kjaer NMTs, including weather sensors, into a network.

The Vaisala sensors are attached to noise monitoring terminals via an RS232 interface, and the measured parameters are transmitted to the central noise monitoring server for later data browsing and reporting.

The multi-sensor weather transmitter, measuring six different weather parameters, is installed mainly into NMTs that are used in permanent noise monitoring at airports.

The Vaisala Weather Transmitter WXT510 product line grew when the Vaisala WINDCAP® Ultrasonic Wind Sensor WMT50 was released in January 2006. The WMT50 is a "wind only" derivative of the WXT510. The new sensor is Brüel & Kjaer's choice for permanent urban noise monitoring terminals, where only wind speed measurements are required.

Cost-savings and long-term partnership

The compact and solid design with no moving parts ensures that the maintenance requirement of the two Vaisala sensors is minimal. In addition, the installation and handling costs are small as several weather parameters are integrated into one sensor.

Brüel & Kjaer's Sales and Marketing Manager, Lars G. Winberg, appreciates the benefits of working with Vaisala: "As we are reselling Vaisala products to our clients we find the limited support requirement and consequently, the low handling cost a true cost-saving. The Vaisala products have proven to be reliable, accurate and very cost-efficient. We consider Vaisala a company that provides security for the long-term supply and service of products".