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Building automation at its best

Vaisala technology supports state-of-the-art laboratory conditions

MIKES is the Centre for Metrology and Accreditation in Finland. It works to ensure that the measurements, tests and inspections carried out in Finland are reliable and internationally comparable, and acts as the Finnish accreditation service (FINAS) for laboratories, inspection and certification bodies, and for the Eco Management and Audit Scheme (EMAS) verifiers.

MIKES also maintains and develops the national measurement standards system through research, and provides high-class calibrations and expert services in metrology. MIKES uses Vaisala

HUMICAP® technology in its state-of-the-art facilities.

Stability of ambient conditions is vital

When MIKES moved into its new facilities on October 1st, 2005, it marked the beginning of a new era for metrology in Finland. The quality of the laboratories meets the highest international standards.

For precision measurements, the stability of ambient conditions such as temperature and humidity is of utmost importance. Different principles have been applied in MIKES' new facilities to





achieve very stable conditions, either locally in small instrument cabinets, or in entire laboratories. The measurement spots are sheltered from external interference from the outside world, as well as from disturbances created in other laboratories. In addition to temperature and humidity control, special attention has been paid to vibration control, electromagnetic shielding and electricity.

Focus on air conditioning

About 30 % of the total area of the new facilities is devoted to building maintenance technology, mainly the air conditioning equipment required for creating laboratory conditions. There are 36 laboratories that are divided into 20 sections, each with its own dedicated air conditioning system used for temperature fine tuning. This means that the operations in one laboratory will not affect the operations of other laboratories in different sections.



Tapio Mansten from MIKES is an expert in intelligent building automation solutions.

The laboratories with the strictest temperature stability requirements are situated in the underground floors. They must have a constant temperature, and are based on the “room-within-a-room” principle. Most of the laboratories are constructed using the floor diffusion principle. One room in which the temperature can be set at 20 ± 5 °C has been built for the study of the temperature dependence of devices and meters.

The desired temperature and humidity in the building is generated in the technical space, where the fresh air is first cooled down to 8.8 °C and the humidity is stabilized to 98% RH. The performance of the two air preconditioning machines is controlled with three Vaisala HUMICAP® Humidity and Temperature Transmitters HMT337. There is one transmitter per machine, and a third one in the duct for redundancy. This cool, moist air is distributed to section-specific ventilation systems as replacement air.

“There are over two thousand other humidity and temperature measurement points in the building controlling the environment. We have reached remarkable measurement accuracy and

resolution. These are the key elements before being able to adjust and maintain the conditions,” says Tapio Mansten Senior Research Scientist, Electricity, Time and Frequency from MIKES.

“To make sure this process runs 24 hours a day with absolute accuracy, we have constructed an independent humidity and temperature monitoring system from 87 Vaisala HUMICAP® Humidity and Temperature Probes HMP45A in the most critical locations for verification, logging and alarm. These measurements need to be in line with the building automation system,” Mansten continues. ■

Further information:
www.vaisala.com/humidity

Metrology is the science of measurement, which includes the development of measurement standards and systems for absolute and relative measurements.