Outdoor mounting of the PTU200 transmitter.

New meteorological buoy in the Baltic Sea

Sentative of the general atmospheric conditions, and the underlying ground must be suitable for relative humidity and temperature measurement. Furthermore, a static pressure head is needed to minimize wind-induced error in barometric pressure measurement.

For outdoor use of the PTU200 transmitter, Vaisala offers an optimized outdoor mounting kit – the PTU200MIK – so PTU measurements can be made at the site of the GPS antenna. The PTU200MIK includes a weatherproof box for the barometer of the PTU200 transmitter and a radiation shield for the humidity and temperature probe. The PTU200TRIPOD tripod, which Vaisala also supplies, is designed for use with the PTU200MIK outdoor mounting kit and ensures portability and quick system set-up.

The PTU200 transmitter can report both the measured pressure at the barometer level and pressure reduced to the site-specific GPS antenna level. This makes it easy to differentiate the pressure calibration information from GPS application-related pressure readings.

Suitable for calibration laboratories

The PTU200 transmitter is also an excellent solution for monitoring calibration laboratory environments, in particular when a single multiparameter transmitter for environmental pressure, temperature and relative humidity is required. While the PTU200 transmitter presents the prevailing conditions on its local display cover, a computer can simultaneously register the PTU conditions at a specified point in time through the transmitter’s serial interface. The environmental parameters, in turn, are then combined with the actual calibration information.

Single waves in the northern Baltic Sea can reach as high as 10 meters, and the wave conditions can be severe, especially in the Gulf of Bothnia. A marine meteorological buoy has been installed to measure weather conditions and waves in the Baltic Sea. The buoy is equipped with Vaisala’s digital barometer designed for extreme marine conditions.

According to Osmo Korhonen from FIMR, the buoy will improve shipping safety on the Baltic Sea.

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In April 1998, a marine meteorological buoy was installed in the open Baltic Sea, 35 miles off the western coast of Finland (61° 48’N 20° 14’E). The buoy is 2.8 meters in diameter. It is maintained by the Finnish Institute of Marine Research (FIMR), the Finnish Meteorological Institute (FMI) and the Finnish Marine Administration.

**Hourly reports on marine weather conditions**

Mr. Osmo Korhonen, Head of FIMR’s Field and Service Group, was one of the key people behind the new marine meteorological buoy installation. As he explains, the marine and meteorological data collected by the buoy will increase shipping safety and improve the quality of local weather forecasts. The same real-time marine weather data is also available to the public via radio or FMI’s phone service.

The new buoy, which measures air temperature and pressure, wind speed and direction, sea water temperature, waves and surface sea currents, is the only permanently moored buoy in the northern part of the Baltic Sea. Once an hour, the collected data is automatically transferred via the Inmarsat-C satellite system to the Finnish Meteorological Institute. So changes in weather and wave conditions can be monitored almost in real-time. If needed – during a storm, for instance – data can be collected every 30 minutes. The database will also be used for climatological research and statistics.

“The buoy is mainly powered by solar energy, although lithium batteries take over in the dark,” notes Mr. Korhonen. “From December to April, when the sea is frozen, the buoy will be maintained on land. It will be re-installed in the same place after the ice breaks up in the spring.”

**Accurate and stable digital barometer**

The newly installed Oceanor buoy is equipped with a Vaisala PTB200A barometer to measure air pressure. Thanks to its low current consumption, the PTB200A digital barometer can be powered by solar energy at remote sites like marine buoys. The barometer is accurate and stable over a wide pressure and temperature range.

The Baltic Sea is an important research target for the Finnish Institute of Marine Research. According to Mr. Korhonen, Vaisala’s PTB200A meets their performance requirements for cost-effective and easy-to-maintain sensors for marine use. The PTB200A has been used for five years on various Oceanor buoys.

**After an extensive testing process, the Japan Meteorological Agency decided to incorporate Vaisala’s instruments in their model JMA-95 automatic surface weather stations. Vaisala barometers have already proven their stability and reliability in tests and in the field.**

Vaisala’s business in Japan began more than twenty years ago when the Meteorological Research Institute of the Japan Meteorological Agency (JMA) installed Vaisala’s HMP14U humidity probes in their newly erected observatory towers. The probes were supplied through Sanko Tsusho Co., Ltd.

The Agency’s model JMA-80 automatic surface weather stations, which were introduced in 1980, use barometers with a vibrating cylinder sensor to measure atmospheric pressure. The latest model JMA-95 automatic surface weather stations, however, are equipped with Vaisala barometers with a capacitive BAROCAP® sensor.

In addition to PTB200AD and PTB220 digital barometers, the Japan Meteorological Agency has incorporated HMP233 humidity and temperature transmitters and FD12P present weather sensors in their observation networks.