Moisture Measurement in Naval and Military Applications

There are many processes and applications within the armed forces which require accurate measurement and control of moisture content, humidity or dew point.

Cockpit breathing air

Breathing air for aircraft pilots is stored in pressurised cylinders. High pressure air must be dry in order to prevent freezing of the components and supply when the air is expanded.

A Michell Instruments MDM50 or MDM300 can be used to measure the dew point of the air supply prior to use, in order to confirm the air is within specifications for dryness.

Missile launch systems

All submarine-launched ballistic missiles (SLBM) are launched using compressed air, to enable the launch to take place under water. Before the launch, the missile tube is pressurised to match the water pressure outside and the hard hatches are opened to leave just a thin diaphragm between the water and the missile. To launch the missile, the diaphragm is removed using an explosive charge, and the missile is dragged out of the tube at speed with the high-pressure air. Once it reaches the surface, the engines ignite and the missile is set to its target.

Although the compressed air is released underwater, starting with a dry supply of air is still important to avoid ice forming and damaging delicate components during the rapid decompression as the missile launches.

Calibration

Where large numbers of dew-point or RH transmitters are used, it is often required, for standards purposes, that they are verified regularly against a calibrated fundamental reference. The OptiCal Humidity calibrator or S8000 Integrale are both suitable for this task, providing easy comparison with the accuracy and repeatability of cooled mirror measurements.

Dry Air Supplies

Most modern naval (and commercial) seagoing vessels utilise compressed air dryers to provide dry air for numerous uses. High pressure air must be dry to prevent freeze-up of values and components when the high pressure (typically 3000-5000 psig) air is expanded. Low pressure air must be dry to prevent condensation and resultant component damage.

An Easidew Transmitter, complete with Monitor and/or ES20 Sampling system, provides full online measurement, including an additional current output and two alarms for triggering of external systems when the dew point of the air leaves a user defined range.

Spot check measurements at points of use for full peace of mind about the gas supply can be facilitated by either an Easidew Portable Hygrometer, or by the fully featured MDM300 Dew-Point Hygrometer – which has the facility to log up to 8000 measurements.

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