
Use of Cooled Mirror Hygrometers as reference standards for manufacturers of compressed air dryers

Application Background

For manufacturers of regenerative desiccant column dryers, it is critically important to monitor moisture content of the dryer outlet to maintain optimal efficiency and consistent quality of output air. This is commonly facilitated through the use of ceramic dew-point transmitters or aluminum oxide moisture probes. Although their rugged design, immunity to contaminants and small size make them ideal for direct installation into the process, ceramic sensors require periodic calibration and verification from higher accuracy devices.

For development work, sophisticated service work and for ceramic transmitter verification there is a need for laboratory instruments with higher precision which can also be taken into the field.

The leading desiccant dryer manufacturers use cooled mirror hygrometers from Michell for their development projects and as a reference for use in in-house calibration programs, ensuring a degree of self-sustainability for their stock of Ceramic sensors. They can also be used in instances where there is a suspected problem with the dryer output, or when the readings of a particular Ceramic sensor are called into question, to provide a spot check with confidence.

Why cooled mirror?

Cooled mirror hygrometers are widely used in calibration and critical process monitoring around the world.

The cooled mirror instruments manufactured by Michell are ideal for a secondary standard application in research and testing. Their fundamental operating principle measures dew-point temperature by controlling the surface temperature of a metal mirror to the point where the mass of condensation formed on the mirror is constant. The instrument utilizes an optical control loop together with a high precision Platinum resistance thermometer (RTD) which measures the surface temperature of the mirror.

The precision of the measurement can be as high as 0.1°C dew point. Cooled mirror based instruments are the only humidity measurement technology capable of providing such high accuracy over a long period of time.

All National Meteorological Institutes (NMIs) use the cooled mirror technology for their own high precision measurements. The Michell S8000 high precision hygrometer is traceable to NPL and NIST.

Advantages

Having their own in-house NPL/NIST traceable cooled mirror - based calibration systems is highly beneficial for the desiccant dryer manufacturers. The extra confidence of the fundamental measurement principle allows for quick resolution of potential disputes with customers. In R&D projects the tests and comparison measurements can be performed with the highest available precision and so increase the overall quality of the designed products.



S8000 Integrale

Sometimes a quick turn-around time for impedance sensor calibration is required to satisfy a demanding customer. With their own transfer standard instrument such tasks can easily be accomplished.

Equipment

S8000 Integrale with a precision of 0.1°C and a pressure range of up to 17 barg

Reference Users

The leading desiccant dryer manufacturers use cooled mirror hygrometers from Michell for their development projects and for in house testing in both fixed installations as well as for portable spot checking: Atlas Copco, Parker Group, Piovan, Munters, Nano Porous Solutions and many others.



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