Precision Humidity Solutions

MICHELL Instruments

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Accuracy you can rely on

Water vapour is a critical factor in many processes. Michell Instruments' range of precision hygrometers is designed to measure and control moisture levels in diverse applications – from trace moisture in laboratory settings to hot, saturated gases in heavy industrial processes.

Our precision hygrometers are based on the fundamental chilled-mirror principle to give you accurate and repeatable measurements of moisture vapour you can trust – whatever your needs. The S4000 and S8000 ranges are suitable for use as national standard reference instruments, providing a firm foundation for your moisture control procedures, while the Optidew range is designed to withstand demanding industrial settings with no loss of accuracy.

Highlights

- Fundamental measurement technique
- Excellent measurement stability
- Wide measurement range –100 to +130°C dew point
- Dynamic contamination correction automatically balances optics to ensure consistent accuracy
- Comprehensive range for process and calibration applications

Why use Chilled Mirror Sensing Technology?

Sensitivity – Michell's chilled mirror products detect minute changes in moisture down to the ppb range.

Accuracy – Chilled mirror technology is accurate to 0.1°C (S8000 and S4000 model).

Drift free – A chilled mirror sensor will measure consistently every time.

Calibration – The S8000, S4000 and Optidew can be used to calibrate relative humidity and dew point instruments. All Michell's products offer traceability to the major national and international standards laboratories.

Rugged – Michell's chilled mirror products are designed to withstand industrial use.

Fundamental – The optical condensation principle of dew point measurement has been established for centuries as the most fundamental method of determining the moisture content of a gas.

Contamination Correction

All Michell's chilled mirror instruments incorporate an automatic compensation system that periodically balances the optics to compensate for any loss of light intensity from contamination.

Background to Michell Instruments

Michell Instruments is the international leader in the field of moisture and humidity measurement solutions. With over 30 years experience, Michell designs and manufactures a wide range of transmitters, instruments and system solutions capable of measuring trace moisture, humidity, dew point and oxygen in a vast range of applications and industries including compressed air, power generation, process, oil and gas, pharmaceutical and many more.

With a fast growing international subsidiary and distribution network, the Michell Group provides solutions in moisture and humidity for the most demanding applications worldwide.

Michell uses four key dew point measurement technologies in its products:

- Impedance method using a ceramic tile which delivers unrivalled speed of response and robustness.
- Chilled Mirror method which has been incorporated into advanced, precision instruments for industrial and laboratory use.
- Dark spot technology, which was developed in partnership with Shell, to offer a world-class solution for the measurement of hydrocarbon dew point.
- Quartz crystal technology for a high precision, fast responding moisture measurement with self-calibration.

Applications

- Air Dryers
- Environmental Chambers
- Power Generation
- Natural Gas
- Pure Gases
- Metrology Laboratories
- Pharmaceutical
- Plastics
- Fuel Cells
- Aerospace
- Food/Beverage Processes
- Chemical
- Metallurgy/Heat Treating
- Petrochemical
- Automotive
- Drying Processes
- Semiconductor Labs
- ... and many more

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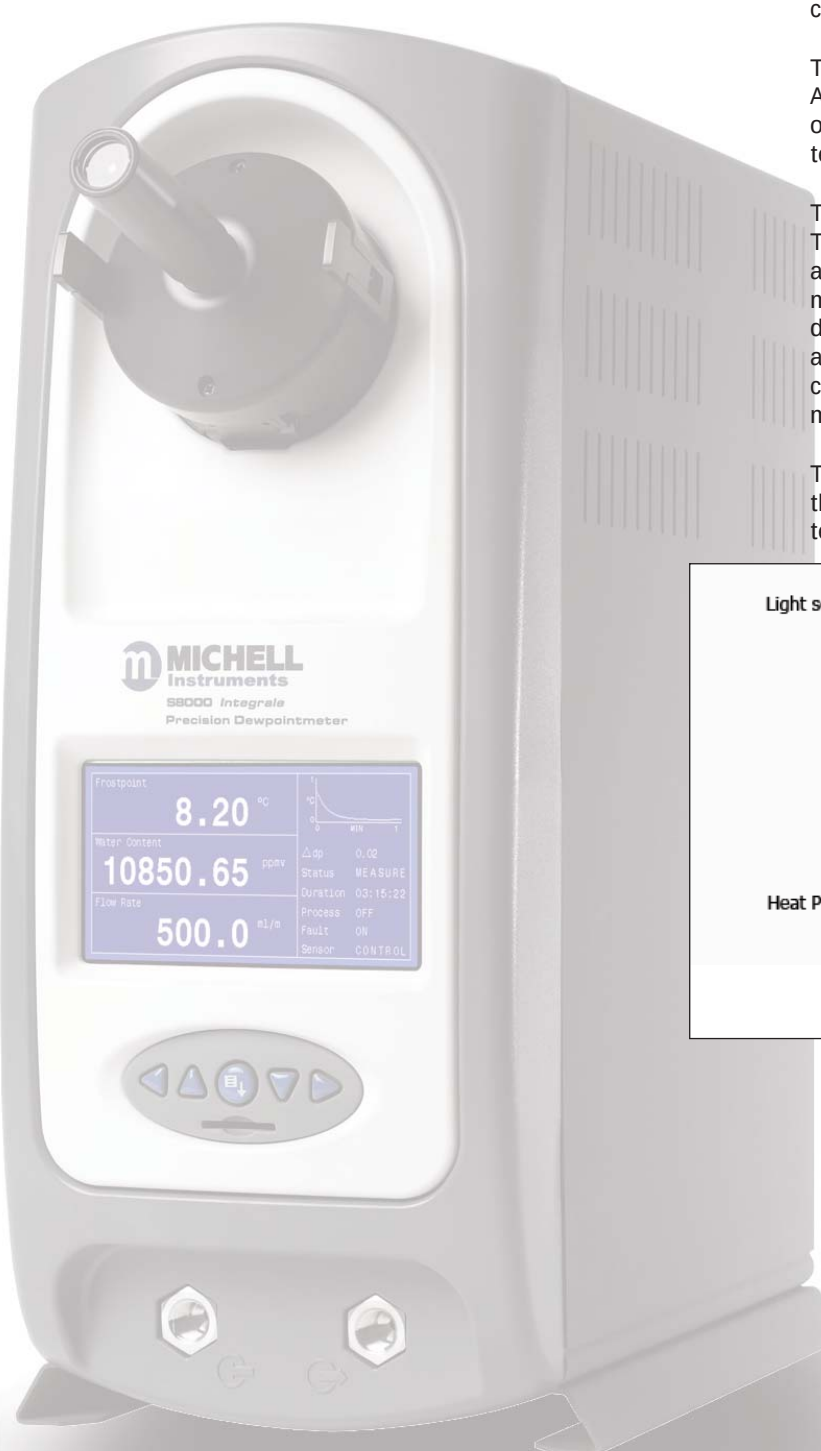
The Technology

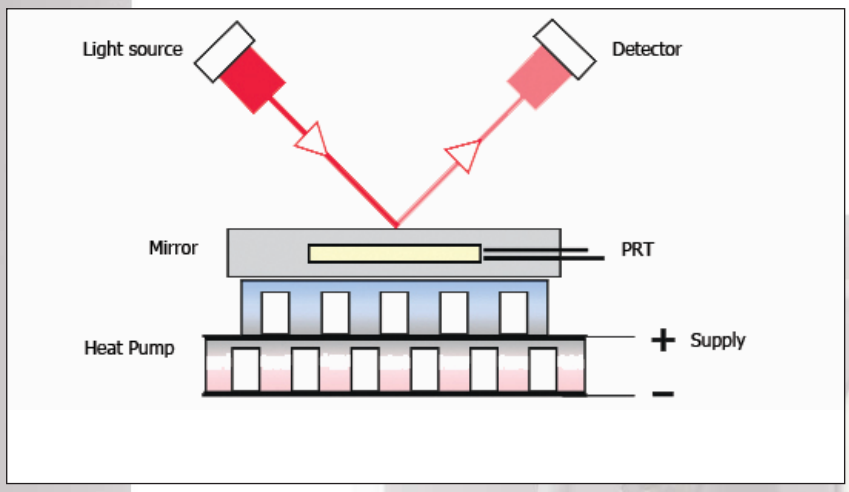
The chilled mirror principle works by passing the sample gas over a polished mirror surface - the temperature of which is controlled by a peltier heat pump.

The mirror is cooled until moisture condenses on its surface. An optical system is used to detect the point at which this occurs, and this information is used to control the mirror temperature and maintain it at the dew point.

The system operates by illuminating the mirror with an LED. The light reflected back is measured by a photodetector and this amount of light is recorded as a datum point. As moisture builds up on the mirror the level of light reflected will decrease. By comparing this signal with the datum point at any time, the system will be able to control the peltier drive circuit to either heat or cool the mirror in order to find and maintain the dew point.

The core of the mirror contains a PT100 platinum resistance thermometer which accurately measures the mirror surface temperature - this temperature is equal to the dew point.





Optidew

- 0.2°C dp measurement accuracy precision hygrometer
- Fundamental measurement – zero drift
- Suitable for process applications
- IP66 industrial housing
- High temperature sensor version to 130°C
- Available as a blind transmitter or with local display

Optidew Vision

- Fundamental, accurate, repeatable drift free measurement performance
- Wide measurement range -40 to +90°C dp <0.5 to 100 % RH
- Dew point, temperature and relative humidity digital and analogue outputs
- 0.15°C dp accuracy option
- High temperature sensor version to 130˚C

S4000

- Widely recognised calibration reference instrument
- 0.1°C dp measurement accuracy
- UKAS accredited calibration as standard
- Wide measurement range -100 to +85°C dp
- Remote sensor available for localised measurements

S8000

- Outstanding measurement performance
- 0.1°C dp measurement accuracy
- Super sensitive dual optics
- Precision measurement to -65°C dp in a compact package
- In built data logging

Optidew

Digital Dew-Point Transmitter

Dew Point Range	-30 to +90°C (1-stage variant) -40 to +90°C (2-stage variant) -20 to +130°C dew point (High temperature)
Accuracy	±0.2°C standard ±0.15°C optional
Operating Temperature	-20 to +90°C (+130°C for high temperature)
Pressure	to 2MPa (20 Barg) standard, to 25MPa (250 Barg) optional

Optidew Vision

Precision laboratory dew-point hygrometer

Dew Point Range	-30 to +90°C (1-stage variant) -40 to +90°C (2-stage variant) -20 to +130°C dew point (High temperature)
Accuracy	±0.2°C standard ±0.15°C optional
Operating Temperature	-20 to +90°C (+130°C for high temperature)
Pressure	to 2MPa (20 Barg) standard, to 25MPa (250 Barg) optional

S4000 Climatic

Precision reference dew-point hygrometer

Dew Point Range	-80 to +85°C
Accuracy	±0.1°C
Operating Temperature	-30 to +90°C
Pressure	to 0.1MPa (1 Barg)

S4000 TRS

Calibration reference dew-point hygrometer

Dew Point Range	-100 to +20°C
Accuracy	±0.1°C
Operating Temperature	0 to +40°C
Pressure	to 0.1MPa (1 Barg)

S8000 Remote

Laboratory standard dew-point hygrometer

Dew Point Range	-30 to +90°Cdp
Accuracy	±0.1°C
Operating Temperature	-20 to +90°C
Pressure Range	to 2MPa (20 Barg) standard, to 25MPa (250 Barg) optional

S8000 *Integrale*

High performance dew-point meter

Dew Point Range	-60 to +40°C
Accuracy	±0.1°C
Operating Temperature	-20 to +50°C
Pressure Range	to 1.7 MPa (17 Barg)

Michell Instruments operates in the following markets:

- Compressed Air Dryers
- Pharmaceutical
- Standards Laboratories and Metrology
- Semiconductors
- Natural Gas and Petrochemicals
- Industrial and Pure Gas Production
- Power Generation

Other Product Ranges

Portable Instruments
Michell's range of easy-to-operate portable instruments provides fast, accurate and stable measurement of dew point, relative humidity and moisture concentration. They are designed to satisfy the most demanding industrial conditions, and are unique in the market for giving repeatedly fast response to low dew points.

Dew Point Transmitters
Chilled Mirror is a fundamental measuring technology offering the user exceptionally accurate, reliable and repeatable measurements from trace moisture to high humidity. Michell offers a range of instruments based on a rugged sensor design that is equally suitable for installation in demanding process environments or for use as an accurate reference instrument in a National Standards Laboratory.

Process Analyzers
Michell's range of analyzers is specifically designed to provide reliable online measurement in process applications such as dedicated water and hydrocarbon dew-point determination in natural gas. Three sensing technologies are used: the Ceramic Impedance sensor for measurements in gas and liquid phase; Quartz Crystal Microbalance for trace moisture in process gases and the Dark Spot Chilled Mirror for hydrocarbon dew point.

Calibration Instruments
Michell has a wide offering of calibration equipment for the verification of trace moisture, dew point and relative humidity sensors. A modular concept means that Michell's engineers can build a customised calibration solution that meets your exact needs. Components may include air compressor and dryer; low range or high range humidity generator; simple sensor housing or environmentally controlled test chamber and finally, verification using a traceable Michell Chilled Mirror Hygrometer.

Oxygen Analyzers
Michell brings you the very latest technologies in oxygen measurement, designed to give years of reliable and accurate service in laboratory, process and flue gas applications. From instruments featuring a unique sealed reference zirconia sensor to a transmitter with the latest generation thermo-paramagnetic oxygen technology, all Michell oxygen analyzers are available in a range of different configurations.

Relative Humidity Instruments
Michell's own RH sensing technology provides excellent resolution, long-term stability and speed of response. We offer a wide range of humidity and temperature measuring sensors and instruments, including relative humidity transmitters, humidity and temperature transmitters as well as handheld indicators. The humidity generator range includes the most stable humidity generator on the market.

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Michell Instruments adopts a continuous development programme which sometimes necessitates specification changes without notice.
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