

Portable Humidity Solutions



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Highlights

- Simple operation – no special training required
- Fast response time
- Excellent accuracy and repeatability
- Long battery life
- Clear and easy to read display
- Integrated sampling system
- Lightweight construction
- Intrinsically safe versions
- Traceable calibrations (NPL, NIST)



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 and dew point in a vast range of applications and industries ranging from 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 five primary moisture measurement technologies across the product line:

- Impedance – using a patented ceramic tile that delivers unrivaled speed of response, stability and ruggedness
- Chilled Mirror – incorporated into our advanced, precision instruments for industrial or laboratory applications
- Capacitive – provides fast, accurate measurement of relative humidity in air and other gases
- Dark Spot – developed in partnership with Shell Research for the precise measurement of hydrocarbon dew point in natural gas
- Quartz crystal technology for a high-precision, fast responding moisture measurement with self-calibration.

Industry Applications

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

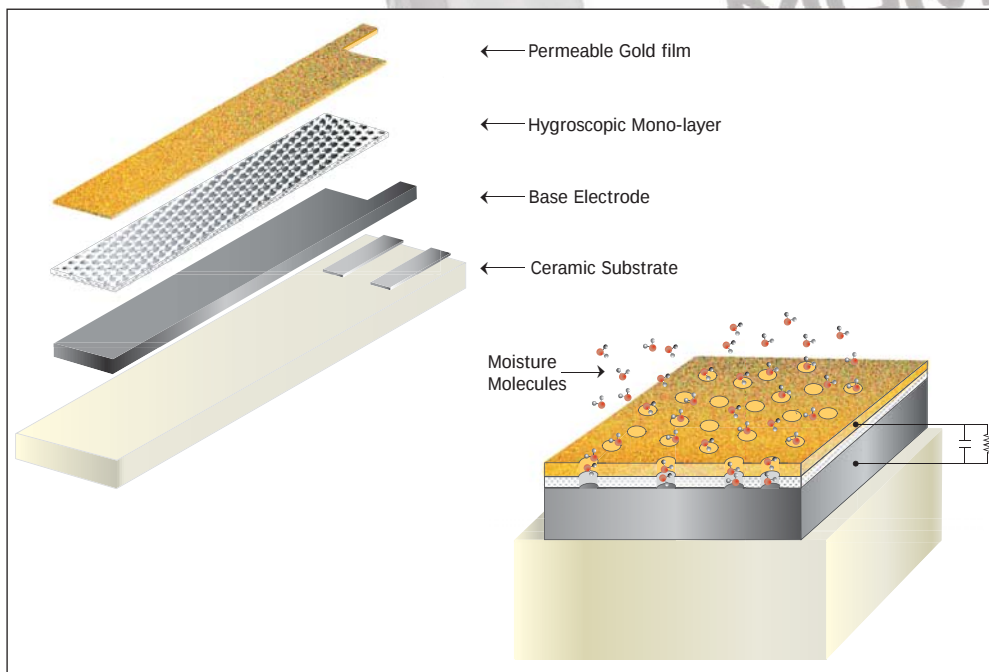


Sensor Technology

Ceramic Impedance Sensor

Michell Instruments' portable dew-point meters use the Advanced Ceramic Moisture Sensor. The operation of this sensor depends on the dielectric property of water molecules absorbing onto an active porous insulating layer sandwiched between two layers of conductive material deposited on a ceramic substrate.

Water has a very high dielectric compared to the dielectric of the active layer and the background of the carrier gas so it can be detected easily. The active layer is very thin – less than one micron and the porous top conductor that allows water molecules to penetrate into the active layer is less than 0.1 micron thick. This allows the sensor to respond very rapidly to changes in the moisture surrounding it both when moisture decreases (drying) and increases in the sensor environment.

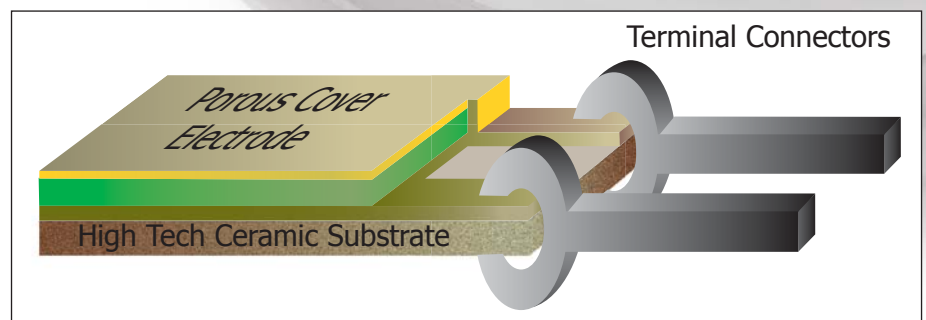


Michell ceramic sensor tile layers

Capacitive Humidity Sensor

A capacitive humidity sensor works like a classic plate capacitor. The lower electrode is deposited upon a carrier substrate. A thin polymer layer acts as a dielectric. The upper capacitor plate is configured as an electrode which is transmissive to water vapour. The polymer layer is hygroscopic.

Water molecules enter this layer and alter its dielectric constant and this results in the changing of the capacitance that can be measured and processed by electronics.



Industrial Dew-Point Meters

- Super fast response time
- Wireless communication via blue tooth
- Versatile sampling
- External sensor option
- Long battery life



Dew-Point Meters for Hazardous Areas

- ATEX / FM / CSA certified
- High accuracy
- Traceable calibration
- Rugged construction
- Data logging facility



Hand-held hygrometers

- Excellent measurement accuracy
- Compact design
- Choice of measurement probes
- RH, temperature, plus a choice of absolute humidity or wet bulb temperature
- Long battery life / auto power off



Easidew Portable

Simple portable with integral sampling system



Range	-100 to +20°C dew point
Accuracy	±2°C dew point
Operating Pressure	0.1 to 20 barg
Sampling System	Filter, flow control
Ingress Protection	IP68 (when closed) (NEMA 6) IP65 (when open) (NEMA 12)

MDM300

Portable with fast response and data logging



Range	-100 to + 20°C dew point
Accuracy	±1°C -60 to +20°C dew point ±2°C -100 to -60°C dew point
Operating Pressure	350 barg max
Measurement Units	°C / °F / K dew point, ppm _v , ppm _w , g/m ³ , g/kg, %RH
Response	≤15 min to -60°C dew point
Data Logging	32 files of up to 10000 logs per file
Ingress Protection	IP66 (NEMA 4)

MDM300 I.S

Intrinsically safe portable with fast response and data logging



Range	-100 to +20°C dew point
Accuracy	±1°C -60 to +20°C dew point ±2°C -100 to -60°C dew point
Operating Pressure	350 barg max
Measurement Units	°C, °F, K dew point & gas temperature ppm _w & g/kg for air, N ₂ , H ₂ , CO ₂ , SF ₆ ppm _v , lb/mmascf & g/m ³ for natural gas ppm _v , g/m ³ & %RH
Response	≤30 min to -60°C dew point
Ingress Protection	IP66 (NEMA 4)
Certification Code	ATEX & IECEx – EX Group II Cat 1G Ex ia IIC T4 Ga -20°C to 60°C CSA/FM – NEC 500 Class1 Div 1 Groups A,B,C,D T4 GOST CE

MDM25

Hand-held hygrometer



Range	0 to 100 %RH
Accuracy at 25°C	< ±0.2°C
Temperature	< ±0.2°C
Humidity – Fixed Probe	±2% RH (10 - 90% RH)
Humidity – Remote Probe	±2% RH (5 - 95% RH)
Measurement Units	Td, a, Tw, %RH, T
Probes	Fixed and Standard Probe Sword Probe Remote Probe

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

Dew-Point Transmitters

Michell offers the widest range of dew-point sensors and transmitters on the market. From the industry standard Easidew 2-wire transmitter to the new, rugged Easidew PRO IS for hazardous areas, all are supplied with sensors traceable to national standards.

Chilled Mirror Instruments

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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