

# CERMET II ON-LINE IMPEDANCE HYGROMETER





## THE INTELLIGENT SOLUTION FOR ON-LINE MOISTURE MEASUREMENT IN GASES

**CERMET II provides the user with:-**

- **SIMPLICITY OF OPERATION**
- **MAXIMUM MEASUREMENT CONFIDENCE**
- **EXTREME FLEXIBILITY**

In industry, the demands for measurement of process parameters are ever increasing. Users rightly want to have more information, more confidence in the measurements, more flexibility in terms of possible modes of operation, and greater ease of application of their measurement instrumentation. And all of this at lower cost.

CERMET II, with its latest generation Michell Ceramic Moisture Sensor, has been designed to meet the needs of today's user and provide the sophistication, reliability and accuracy required in an easy to use and cost effective package.

## SIMPLICITY OF OPERATION

The CERMET II Hygrometer is delivered to you complete, tested, calibrated and ready to install. All you need to do is connect your gas supply and power source; then you are ready to measure!

CERMET II is supplied as standard with the CERMET II Monitor unit, Ceramic Moisture Sensor and an interconnecting signal cable:

The CERMET II Monitor is a fully self-contained display system in a 1/8 DIN panel mounting case, which indicates the measured humidity parameter (dewpoint °C or °F, ppmV, lbmmscf or gm<sup>3</sup>), pressure compensation (if required), current and digital outputs and two 10A alarm relays.

The CERMET II Sensor contains all the embedded intelligence afforded by Michell's 25 years in the humidity business. This smart sensor has a measurement range of -100 to +20°C dewpoint at pressures up to 300 barg and offers a startling measurement accuracy of better than 1°C dewpoint from -60 to +20°C dewpoint. Below -60 the accuracy is an impressive ±2°C dewpoint. Calibration data for each sensor is stored within it's EEPROM ensuring that all sensors are truly and absolutely interchangeable. No re-programming of electronics, no adjustment of potentiometers, no flipping of selector switches is necessary.

Interconnection between the CERMET II Sensor and Monitor is via a simple cable link, with a maximum cable distance between the two of 1200m. Since the communication protocol is digital (mNET) the sensor is insensitive to interference from external EMI sources.

## MAXIMUM MEASUREMENT CONFIDENCE

Michell's latest generation Ceramic Moisture Sensor combines a wealth of experience in the production of humidity sensors with state of the art electronics to give a combination of great power, performance and reliability.

Calibration traceability to International Standards is achieved through our NAMAS accredited laboratory. We maintain direct traceability both to NPL and to NIST. Through the EAL European accord our calibration traceability is recognised throughout Europe and the rest of the World. Every CERMET II sensor is calibrated at 13 points across the measurement range, with readings referenced against a NAMAS calibrated cooled mirror dewpointmeter. Accuracy is verified by a three stage repeat test programme to ensure that your instrument performs to its optimum capability.

Michell's sensors have proven themselves over many years to be the most rugged and reliable available. Whether the application is for measurement of high purity gases or sour natural gas with high levels of corrosive acid components, the Michell Ceramic Moisture Sensor is up to the challenge. Independent tests have shown our sensors to perform in such demanding applications for years with no deterioration in performance.

The inclusion of an on-board processor in the sensor electronics gives it the power to perform beyond expectations. This provides total confidence, reliability and interchangeability of sensors.

## EXTREME FLEXIBILITY

Whilst the **CERMET II** Hygrometer is so simple it can be operating minutes after taking it out of the box, it has such power and flexibility that it can be used for almost any humidity measurement application.

### Measurement units:

The instrument can be configured from the front panel to display in °C or °F dewpoint, in parts per million by volume with user selectable range and resolution, in pounds per million standard cubic feet, or in grams per cubic metre. In all modes except dewpoint, corrections can be made for the effect of variations in gas pressure.

### Pressure correction:

The dewpoint of a gas will vary with the pressure of the gas. **CERMET II** can compensate for variations in gas pressure either by the use of a live pressure transducer input, or by the use of a pressure factor calculation input via the instrument front panel.

### Power supply:

**CERMET II** is supplied with a universal 85 to 265 V AC, 90 to 370 V DC power supply. As an option, a low voltage (9 to 60 V DC, 18 to 36 V AC) version can be supplied.

### Alarms:

For control of external devices **CERMET II** is supplied as standard with two 10A/240V c/o fully user configurable alarms. These can be set over the full operating range of the instrument, with full unit choice and variable hysteresis. The alarms can also be configured to flag sensor or cable fault conditions. A further two alarms can be added if required.

### Outputs:

As standard, **CERMET II** is supplied with a 4-20 mA output which is fully configurable for range and scale. Also a 2-way RS232 digital signal is provided which gives full data access to the user and allows availability for all set-up and configuration parameters. Optionally a 0-10V configurable analogue output can be specified, as can be an RS485 2-way digital port.

## INTRINSICALLY SAFE VERSION

The **CERMET II** Monitor, when combined with Michell's **TRANSMET I.S.** Dewpoint Transmitter, is the ideal solution for measurement and display of dewpoint in a hazardous gas. **TRANSMET I.S.** is CENELEC certified EEx ia IIC T4 when used in conjunction with a pair of galvanic isolation barriers. The **CERMET II** Monitor must of course be located in a designated safe area.

## ENVIRONMENTAL PROTECTION

Hygrometers often need to perform in harsh environments. **CERMET II**'s sensor is designed to meet the rigours of industrial applications. Constructed in stainless steel, the sensor is tested to IP66 (NEMA 4) and has an operating temperature range of -40 to +60°C. The **CERMET II** Monitor is protected to IP54 (NEMA 12) and can be supplied to special order with a front panel giving an IP66 (NEMA 4) rating. Its operating temperature range is -20 to +50°C.



**TRANSMET I.S.**  
can be used with the **CERMET II**  
Monitor for hazardous gas applications



Courtesy of Domnick Hunter Ltd.

Courtesy of Mobil North Sea Ltd.

Courtesy of NDMSCO Well Services Ltd.

Courtesy of SASOL

The **CERMET II** Hygrometer affords the benefits of reliable on-line analysis of moisture in virtually any gas flammable or non-flammable, inert or corrosive.

*Photograph 1 - **CERMET II** provides the solution to both energy management and quality assurance in the supply of compressed air from heat regenerative, adsorption dryers.*

*Photograph 2 - The durability of the advanced Ceramic Moisture Sensor comes to the fore in applications such as pipeline drying using vacuum and dry gas purging techniques.*

*Photograph 3 - The **CERMET II** offers time proven performance in critical applications for moisture measurement in natural gas including sour gas at off-shore processing facilities.*

*Photograph 4 - The resilience of the advanced Ceramic Moisture Sensor in potentially corrosive atmospheres provides the answer to moisture control in refinery catalytic reformer recycle gas and many other petrochemical applications.*

**Here we have shown but a few of the many applications for which CERMET II is the solution - To discuss your requirements contact Michell direct or your local representative.**

## SPECIFICATIONS

### Sensor

Sensor type	Michell Ceramic Moisture Sensor
Gas wetted components	316 stainless steel
Sensor mounting thread	5/8" UNF (parallel)
Sensor body	Stainless Steel
Connector type	DIN 43650C sealed
Ingress protection (sensor)	IP66 (NEMA 4)
Measurement range	Calibrated from -100 to +20°C dewpoint;
Operating temperature	-40 / +60°C (compensated over -20/+40°C)
Accuracy	± 1°C from -59 to +20°C dewpoint ± 2°C from -100 to -60°C dewpoint
Resolution	0.1°C from -79 to +20°C dewpoint 1.0°C from -100 to -80°C dewpoint
Communication	mNET communication protocol

### Instrument (Default)

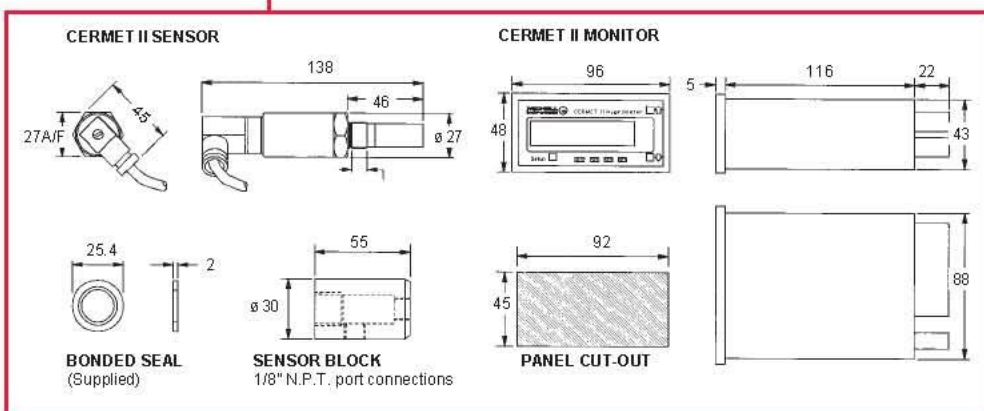
Instrument type	<b>CERMET II</b> Monitor Unit
Measurement Units	1) Dewpoint °C & °F 2) ppmV 0000 to 1000 with user selectable range & resolution 3) lb mmscf range dependent on pressure 4) gm <sup>-3</sup>
Secondary measurement variable	Pressure via external transducer 0-3000 psig Completely user configurable for any industry standard transducer Automatic compensation for pressure sensitive measurement units
Power supply	Universal 85 to 265V AC, 90 to 370V DC
Ingress protection	IP54 (NEMA 12) IP66 (NEMA 4) for front panel only with optional cover
Measurement range	Calibrated from -100 to +20°C dewpoint;
Operating temperature	-20 / +50°C
Relays	2 off 10A / 240V c/o fully user configurable; can accommodate full range + full unit choice + sensor fault alarm functions
Outputs:	
RS232	Provides 2-way communication: full data access to user + total availability of all set-up and configuration
4-20 mA	Fully user configurable for range and scaleable

### Instrument II (Options)

Power supply	Low Voltage Option: 9 to 60V DC, 18 to 36V AC
Relays	1 or 2 further 5A relays (max 4 in total) r/o type fully user configurable; can accommodate full range + full unit choice + sensor fault alarm functions
Outputs:	
RS485	Provides 2-way communication: full data access to user + total availability of all set-up and configuration
0-10 V	Fully user configurable for range and scaleable

### CERMET II I.S. (Variations)

Additional PSU (for <b>TRANSMET</b> )	24V DC clip-on rail type
Barriers	2 galvanic isolation type
Sensor	<b>TRANSMET I.S.</b>
Instrument	<b>CERMET II</b> Monitor Unit as above + analogue input board



W I T H U S

대전광역시 대덕구 대화동 289-1  
산업용제유통단지 11동 112호  
TEL : 042)6 7 0 - 7 8 4 0  
FAX : 042)6 7 0 - 7 8 4 8