

# MDM50

## Portable Hygrometer

A compact and easy to use portable hygrometer with fast response, integrated sampling system and traceability to National Standards.



### Highlights

- Rapid spot-check measurements to  $-50^{\circ}\text{Cdp}$
- T95 to  $-35^{\circ}\text{C}$  dew point in <10 minutes
- Simple operation
- Integral sampling system
- Industrial case
- $\pm 2^{\circ}\text{Cdp}$  accuracy
- 9-point traceable calibration
- 16 hours of operation between charges

### Applications

- Compressed air dryers
- Medical gases
- Plastic molding dryers
- Instrument air
- Ozone generators

# MDM50 Hygrometer

## Affordable, Simple Dew-Point Measurement

The MDM50 Hygrometer has been designed to make spot checks of the dew point in air and gases as simple and fast as possible. This completely self-contained instrument weighs just 4kg (8.8lbs) and is delivered ready to use. Simply connect your sample gas to the Quick Connect (or optional Swagelok®) fittings, turn on the instrument and it will automatically begin to measure the dew point of the applied sample.

## Intelligent and Interchangeable Sensor Technology

The MDM50 uses Michell's advanced polymer moisture sensing technology. The sensor is coupled with the latest microprocessor-based measurement circuitry to produce a fully calibrated and interchangeable sensor transmitter module. All calibration data is stored in flash memory, so on-site sensor exchange for calibration or service can be performed quickly, even by untrained personnel.

## Fully Integrated Sampling System

The MDM50 is unique among portable hygrometers. Michell Instruments has built into the standard design, a complete sampling system that easily allows you to measure the dew point of any air or gas line, at up to 2 Mpa (20 barg / 290 psig) pressure. The two interchangeable inlet/outlet fittings allow you to choose between dew point measured at atmospheric, or at line pressure, by simply swapping the position of the fittings. An integrated filter housing uses standard filter cartridges and provides 99.5% protection against particles down to 0.3µm. Optionally, Swagelok® tube couplings can be specified to allow operation of the unit at up to 30 Mpa (300 barg / 4351 psig).

## Measurement Under Your Control

The hygrometer features an extremely clear and bright 0.5" red LED display making it easy to determine the dew point of your process even in dim conditions or direct sunlight. Michell also provides a 4–20 mA analog output for connection to a chart recorder, data-logger or computer system, so dew-point trends can be analyzed over time.

## Designed For Use In The Field

A field instrument must be easy to carry and use. As its name suggests, the MDM50 has been designed to be perfectly transportable. It is small with an ergonomic carrying handle and weighs only 4kg (8.8lbs). The case of the hygrometer provides NEMA 6 protection and the outer case is covered by a lifetime guarantee, so can be returned to the factory for repair or replacement, free of charge.

## Long Battery Life

The MDM50 uses a rechargeable NiMH battery pack and is delivered complete with a universal battery charger that fits neatly into the instrument lid. It will operate for up to sixteen hours on a full charge. A battery charge indicator on the instrument front panel warns when the battery is low.

## Reproducibility and Calibration Integrity

The MDM50 polymer moisture sensors are subject to a 9-point calibration, where their performance is characterized against a fundamental reference hygrometer. This process, and subsequent quality testing, ensures that all sensors behave optimally before they are used in the field.

## Traceable Calibration

Each MDM50 is supplied with a calibration certificate, traceable to national standards (NPL & NIST) from Michell Instruments' accredited laboratory.



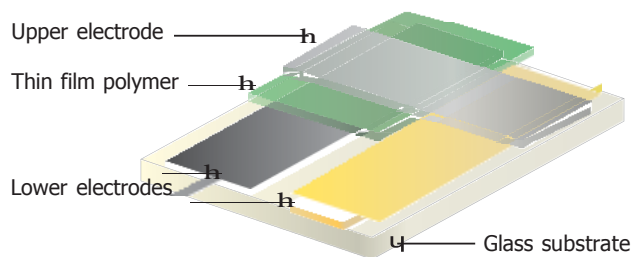
## Technology: Polymer Sensor

A capacitive humidity sensor works like a plate capacitor. The lower electrode is deposited on a ceramic substrate. A thin polymer hygroscopic layer acts as the dielectric, and on top of this is the upper plate, which acts as the second electrode but which also allows water vapor to pass through it, into the polymer.

The dielectric strength of the polymer is proportional to the water vapor content. In turn the dielectric strength affects the capacitance, which is measured and processed to give a relative humidity measurement. By combining this figure with a measurement of temperature, a dew point or absolute humidity value can be calculated.

### Advantages of Polymer

- Very fast response
- Long-term stability
- Resistant to most chemicals
- Not permanently damaged by liquids
- Insensitive to contamination by particulates

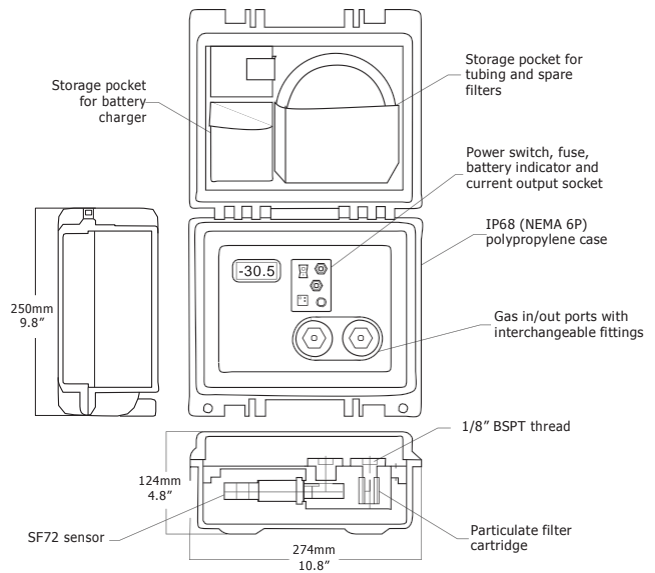


Michell's polymer sensor tile

# Technical Specifications

| Performance                   |  |
|-------------------------------|--|
| <b>Measurement technology</b> | Polymer Capacitive   |
| <b>Measurement range</b>      | -50 to +20°Cdp (-58 to +68°Fdp)  |
| <b>Accuracy</b>               | ±2°Cdp (±3.6°Fdp)  |
| <b>Run time</b>               | 12 to 16 hours   |
| <b>Charge time</b>            | 16 hours for maximum charge  |
| <b>Flow rate</b>              | 1 to 5 NI/min  |
| Electrical Input/Output       |  |
| <b>Output</b>                 | 4–20 mA current maximum load resistance 400 Ω  |
| <b>Power supply</b>           | Rechargeable NiMH battery pack, charger included   |
| Operating Conditions          |  |
| <b>Operating temperature</b>  | -20 to +50°C (-4 to +122°F)  |
| <b>Storage temperature</b>    | -40 to +75°C (-40 to +167°F)   |
| <b>Operating pressure</b>     |  |
| <b>Low pressure version</b>   | Up to 2 MPa (20 barg / 290 psig)   |
| <b>High pressure version</b>  | Up to 30 MPa (300 barg / 4350 psig)  |
| Mechanical Specifications     |  |
| <b>Display</b>                | Flush mounted 3.5 digit red LED  |
| <b>Case</b>                   | Yellow propylene with charger, sample tubing and output connector stored in the lid  |
| <b>Weight</b>                 | 4kg (8.8lbs) total weight  |
| <b>Enclosure rating</b>       |  |
| <b>Case closed</b>            | NEMA Type 6  |
| <b>Sample connections</b>     | Optional: Legris pneumatic fittings<br>6mm Swagelok® tube fittings<br>1/4" Swagelok® tube fittings   |
| <b>Sample block</b>           | Stainless steel, fully self-contained sample system with fixed orifice ports for flow control/pressure or atmospheric measurement and built-in filtration using a standard drop-in cartridge |
| <b>Filter cartridge</b>       | Removes 99.5% of particles ≥0.3µm supplied with cartridge installed. Spare cartridges are available (part no: SSF-PF-10PK)   |
| <b>Sample tubing</b>          |  |
| <b>Low pressure version</b>   | 2m (6.6') of 6mm (0.2") O/D PTFE supplied  |
| <b>High pressure version</b>  | Metering valve and port adaptor  |

# Dimensions



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Michell Instruments adopts a continuous development programme which sometimes necessitates specification changes without notice. Issue no: MDM50\_97477\_V1.2\_US\_0718