

# MDM300 & MDM300 I.S.

## Advanced Dewpoint Hygrometer

A high-speed dew-point hygrometer for repeatable, fast and accurate moisture content measurements in many applications, including compressed air, medical gases and natural gas. This lightweight, ATEX and IECEx certified portable instrument allows far more measurements per working hour than any other comparable product. Logged data can be downloaded wirelessly via a Bluetooth connection eliminating the need to carry connecting cables.



### Highlights

- Repeatedly fast measurements in less than 10 minutes for t95 down to -70°C dp
- Easy operation: just switch on and measure
- Long battery life: 48 hours of typical use between charges
- Bluetooth connection for trouble-free download of data
- Best in its class: 1°C dp accuracy, 13 point traceable calibration certificate
- 4-20mA external device input for transmitter calibration and validation
- Operates in pressures up to 350 bar
- Lightweight: less than 1.5kg
- Multiple engineering units, multiple languages.

### Applications

- Monitoring of desiccant dryers for compressed air or plastic moulding equipment
- Moisture measurement in high-voltage switchgear quench gas
- Dew point in natural gas processing and pipelines
- Moisture measurement in petrochemical refineries
- Industrial gas production and transportation
- Medical gas quality
- Dew-point measurement in metallurgical applications
- And many more...

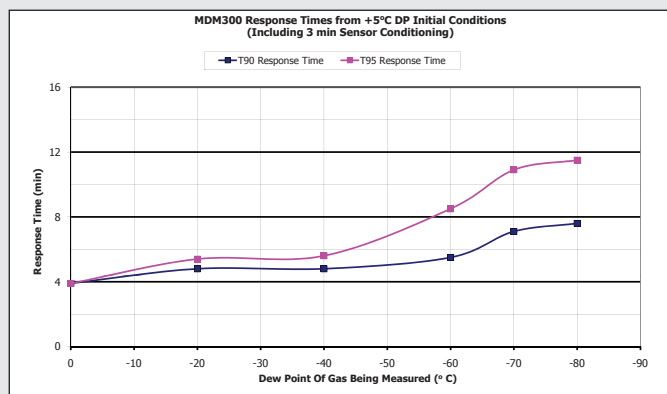
## Michell MDM300 & MDM300 I.S.

Ideal for spot checks of dew point or moisture content, the MDM300 & MDM300 I.S. includes all the features needed for efficient work. An extremely fast response and accurate, stable measurement is complemented by an instrument which is easy to use, has data-logging and built in sampling components as standard, and can be supplied with a range of accessories including sampling systems and a professional carry case. For use in hazardous areas the MDM300 I.S. has ATEX certification to  $\text{II 1 G Ex ia IIC T4 Tamb } -20^{\circ}\text{C to } +60^{\circ}\text{C}$ . Other hazardous areas certification will follow. The MDM300 and MDM300 I.S. are both IP66/NEMA 4 rated, and therefore suitable for demanding outdoor applications.

### Features

#### Increased efficiency due to fast response

Faster response to low dew points reduces the waiting time for every measurement, not just the first of the day. This allows the user to make many more measurements each day, dramatically increasing work efficiency when compared to other instruments on the market. The MDM300 and MDM300 I.S. make accurate and stable dew point measurement down to  $-70^{\circ}\text{C dp}$  in less than 10 minutes ( $t_{95}$ ).



#### Simple to use

The menu-driven display, easily accessible gas connections and application software means that the user can quickly and easily set up the instrument and be taking measurements within minutes. All measurement parameters are available at a touch of a button. The keys can be operated in rough environmental conditions where the operator may need gloved hands.

#### Wireless connection

The MDM300 utilises the latest Bluetooth technology to provide wireless communications for instrument set-up and for downloading logged data. No missing cables means a more efficient and simple remote connection saving the user time and money.

#### Best accuracy

Best-in-class accuracy of  $1^{\circ}\text{C}$  dew point gives the user improved measurements. Every instrument undergoes a 13 point calibration over a period of 10 days and all calibration certificates are traceable to national standards via the NPL (UK) and NIST (USA).

#### External sensor connection via 4-20mA loop-powered input

External sensors for the measurement of dew point, pressure or temperature can easily be connected to the MDM300 to display the values or further increase accuracy via pressure and temperature-compensated measurements. In addition the MDM300 can be used to check and recalibrate Michell Easidew dew-point transmitters, reducing downtime and calibration costs.



For the MDM300 I.S. Michell Instruments supplies an interface box allowing connection to the Easidew TX I.S. or Easidew PRO I.S. dew-point transmitters.

#### Versatile sampling

The MDM300 offers versatile sampling arrangements ranging from simple fixed orifices for low pressure measurement to configurable high-pressure sampling systems up to 350 barg. In addition a number of application kits are available providing the sampling and connection components specific for customers' applications. Please contact Michell Instruments or see separate datasheet for further details

#### Measurement in hazardous areas

The MDM300 I.S. has been certified by ATEX & IECEx (FM and CSA pending) for use in hazardous areas. This is the perfect portable instrument for use in natural gas plants, petrochemical refineries, offshore platforms and a range of other hazardous areas, whether or not the gas being measured is classified as hazardous.



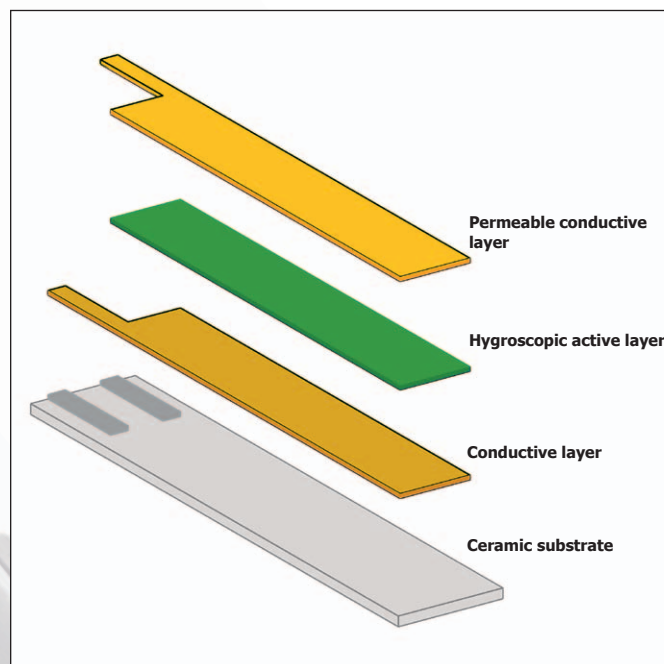
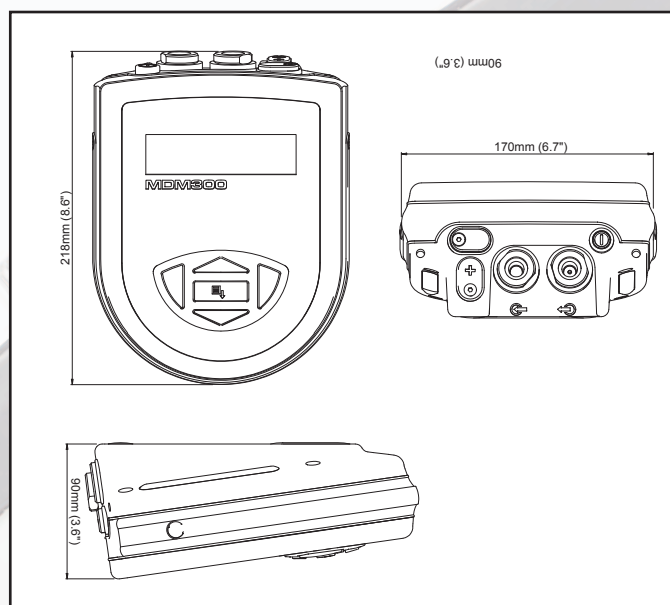
## Sensor Technology

### Ceramic Impedance Sensor

The MDM300 uses Michell's highly developed ceramic Impedance sensor, which is constructed using state-of-the-art thin and thick film techniques. Operation of the sensor depends upon the adsorption of water vapour into a porous non-conducting "sandwich" between two conductive layers built on top of a base ceramic substrate. The active sensor layer is very thin – less than one micron and the porous upper layer that allows transmission of water vapour into the sensor is less than one nano-metre.

The resulting sensor responds rapidly to changes in moisture – both in measuring humidity and also when being dried. It is very rugged and gives 1°C dew-point accuracy coupled with excellent long-term reliability and stability.

### Dimensions in mm



Michell ceramic sensor tile layers

## Ordering Information

Order code	Description
MDM300 STD	MDM300 Advanced Dew-Point Hygrometer Standard version
MDM300 IS	MDM300 I.S. ATEX certified for use in hazardous areas

### Accessories available

- Carry bag
  - Gas fittings in various sizes
  - External dew-point sensor
  - Cable for external dew-point sensor – various lengths available\*
  - External temperature sensor – various cable lengths available\*
  - External pressure sensor – various cable lengths available\*
  - Bluetooth dongle
  - Battery powered sample pump\*
  - Hard carry case
- \*Not MDM300 I.S.

Please contact Michell Instruments for a full list of accessories and spares with order codes and prices.



# Technical Specifications

Product	MDM300	MDM300 I.S.
<b>Performance</b>		
Measurement Technology	Michell ceramic sensor	
Accuracy	$\pm 1^{\circ}\text{C}$ from $-60$ to $+20^{\circ}\text{C}$ dew point $\pm 2^{\circ}\text{C}$ from $-100$ to $-60^{\circ}\text{C}$ dew point $\pm 0.2^{\circ}\text{C}$ temperature	
Measurement Range	Calibrated $-100/+20^{\circ}\text{C}$ dew point Readings to $+30^{\circ}\text{C}$ dew point	
Measurement Units	$^{\circ}\text{C}$ , $^{\circ}\text{F}$ , K dew point & gas temperature ppm <sub>v</sub> , ppm <sub>w</sub> for air, N <sub>2</sub> , H <sub>2</sub> , CO <sub>2</sub> , SF <sub>6</sub> %RH, g/m <sup>3</sup> , g/kg Option: active pressure (bara/g, psig, MPa, KPa)	$^{\circ}\text{C}$ , $^{\circ}\text{F}$ , K dew point & gas temperature ppm <sub>w</sub> & g/kg for air, N <sub>2</sub> , H <sub>2</sub> , CO <sub>2</sub> , SF <sub>6</sub> ppm <sub>w</sub> lb/mmscf & g/m <sup>3</sup> for natural gas ppm <sub>v</sub> g/m <sup>3</sup> & %RH
Resolution (display)	0.1 for all dew-point derived units and autoranging where appropriate	
Resolution (measurement)	Better than $0.1^{\circ}\text{C}$ dew point	
Typical Response Speed	T95 in $\leq 10$ minutes to $-70^{\circ}\text{C}$	T95 in $\leq 15$ minutes to $-70^{\circ}\text{C}$ dew point in Air
Measurement System Repeatability	Better than $0.1^{\circ}\text{C}$ dew point	
Measurement System Hysteresis	$0.05^{\circ}\text{C}$ dew point	
<b>Electrical input/output</b>		
Auxiliary Inputs	4-20mA loop-powered external input selectable as either dew point, temperature or pressure	Connection to Michell Easidew TX IS or Easidew PRO I.S. via Remote Sensor Interface
Battery Type	NiMH 4.8V	
Battery Operating Life	More than 48 hours of typical usage between charges	More than 24 hours of typical usage between charges
Battery Charger	Intelligent charger (supplied)	Intelligent charger. (Charger not certified for hazardous area use.)
<b>Operating conditions</b>		
Operating Pressure	350 Barg max	
Operating Environment	Outdoors 0 to $+100\%$ RH condensing	
Operating Temperature	$-20$ to $+50^{\circ}\text{C}$	
Storage/Transport Temperature	$-40$ to $+70^{\circ}\text{C}$	
<b>Mechanical specification</b>		
Display	Blue LCD graphical display	
Enclosure Type	Steel fibre-loaded high-impact polyamide 6	
IP/NEMA Rating	IP66/NEMA 4	
Gas Connections	1/8" NPT female (other options available)	
Flow Across Sensor	0.2 to 2.0 NI/min	0.2 to 0.5 NI/min
Filters	50 micron stainless steel sinter in the inlet port	
Gas Wetted Materials	AISI 316L stainless steel	AISI 316L stainless steel, PTFE Seal, Borosilicate glass, ceramic
Outline Dimensions	218mm x 170mm x 90mm (d x w x h)	
Weight	1.35kg	1.5kg
<b>General</b>		
Data Logging	8 megabytes; Log interval: 5 to 60 sec; Logs per log file: Up to 10,000	
Communications	(Wireless) Bluetooth™ range up to 5m (version 2.0)	
Languages	English, French, German, Italian, Portuguese, Spanish	
<b>Certification Codes</b>		
	None	ATEX & IECEx – EX Group II Cat 1G Ex ia IIC T4 Ga $-20^{\circ}\text{C}$ to $60^{\circ}\text{C}$ FM – NEC 500 Class1 Div 1 Groups A,B,C,D T4 CSA - Pending

**Michell Instruments** 48 Lancaster Way Business Park, Ely, Cambridgeshire, CB6 3NW

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