

# MDM300 & MDM300 I.S.

## High Speed Dewpoint Hygrometer

A high-speed portable dew-point hygrometer, offering rapid spot-check measurements of dew point or moisture content in many applications, including compressed air, natural gas and high voltage switchgear quench gas. This lightweight, ATEX, IECEx, FM, CSA and GOST certified product allows more measurements per working hour than any other comparable product. A hard-wearing but ergonomic case and an easy-to-use interface allows comfortable operation in the toughest industrial environments.



### Highlights

- Repeatedly fast measurements at low pressure in less than 15 minutes for t95 down to -60°C dew point (-76°F dew point)
- Higher pressure measurements possible – up to 350 barg (5076 psig)
- Long battery life: up to 48 hours of typical use between charges
- Intuitive application kits allow quick and straightforward connection to your sample point
- Durable, yet easy to handle and operate: designed for use in industrial environments
- 4-20mA external device input for transmitter calibration and validation
- Lightweight: less than 1.5kg (3.31 lbs)
- 13 point traceable calibration certificate

### Applications

- Dew point in natural gas processing and pipelines
- Monitoring of desiccant dryers for compressed air or plastic moulding equipment
- Moisture measurement in high-voltage switchgear quench gas
- 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 are 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  $\text{Ex II 1 G Ex ia IIC T4 Tamb } -20^{\circ}\text{C to } +60^{\circ}\text{C } (-4 \text{ to } +140^{\circ}\text{F})$ ; FM; CSA; IECEx and GOST-R and GOST-K Standards. The MDM300 and MDM300 I.S. are both IP66/NEMA 4 rated, and therefore suitable for demanding outdoor applications.

## Features

The MDM300 can provide measurement to  $-60^{\circ}\text{C}$  dew point in gases at atmospheric pressure in less than 15 minutes (30 minutes to  $-60^{\circ}\text{C}$  dew point for MDM300 I.S.). This, combined with no required waiting time between measurements, allows the user to take many readings per day, increasing efficiency and reducing costs when compared to other instruments on the market.

### Simple to use

The rugged but ergonomic design of the MDM300 combines industrial durability with comfortable one- or two-handed operation. The intuitive menu system and large, easy-to-press buttons enable the user to easily configure the instrument to display the parameters they require even with gloved hands.

### Best accuracy

Best-in-class accuracy of  $1^{\circ}\text{C}/1.8^{\circ}\text{F}$  dew point (from  $-60$  to  $+20^{\circ}\text{C}$  ( $-76$  to  $-4^{\circ}\text{F}$ ) 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, and their readings displayed on the screen. These inputs can also be used to augment the measurement, such as by producing live pressure compensation. In addition the MDM300 can be used to check and recalibrate Michell Easidew dew-point transmitters, affording the user the benefit of a verification without the associated downtime.

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 (5076 psi). A number of application kits are available providing out of the box sampling systems specifically for the most popular applications. Please contact Michell Instruments for further details.



### Measurement in hazardous areas

The MDM300 I.S. has been certified by ATEX & IECEx, FM, CSA and GOST, 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.

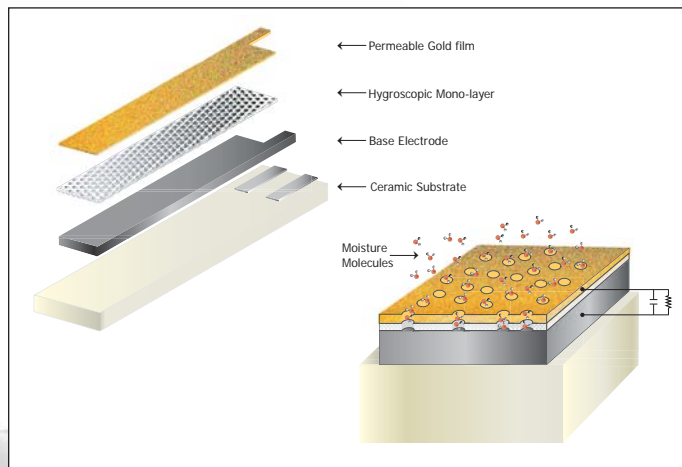


## Sensor Technology

### Ceramic Impedance Sensor

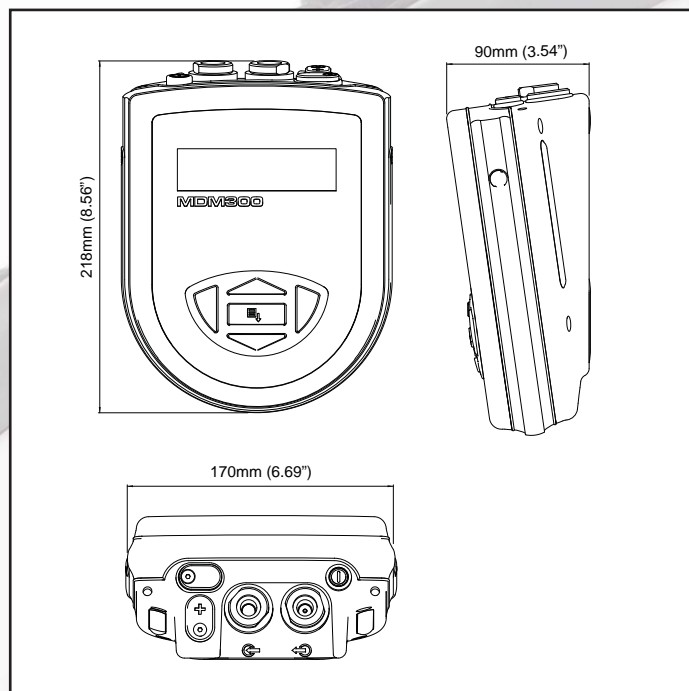
The MDM300 uses Michell’s highly developed ceramic Impedance sensor, which is constructed using state-of-the-art thin and thick film techniques. Operation of the sensor depends upon the adsorption of water vapour into a porous non-conducting “sandwich” between two conductive layers built on top of a 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  $\pm 1^{\circ}\text{C}$  ( $\pm 1.8^{\circ}\text{F}$ ) dew point accuracy coupled with excellent long-term reliability and stability.



Michell ceramic sensor tile layers

## Dimensions



## Ordering Information

Order code	Description
MDM300-STD	MDM300 Advanced Dew-Point Hygrometer Standard version
MDM300-IS	MDM300 I.S. ATEX, FM; CSA 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.

### Application kits available

MDM300-EFS	Basic sampling kit with flow meter and needle valves
MDM300-Atmos	Connection kit with sample pump
MDM300-COM	Compressed air application kit
MDM300-MED-KIT	Medical gas sampling kit
MDM300-SF6-D8	SF6 sampling kit with DN8 input
MDM300-SF6-D20	SF6 sampling kit with DN20 input
MDM-300-BAG	Capture bag for SF6

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

# Technical Specifications

Product	MDM300	MDM300 I.S.
<b>Performance</b>		
Measurement Technology	Michell ceramic sensor	
Accuracy	± 1°C from -60 to +20°C (± 1.8°F from -76 to +68°F) dew point ± 2°C from -100 to -60°C (± 3.6°F from -148 to -76°F) dew point ± 0.2°C temperature (0.36°F)	
Measurement Range	Calibrated -100 to +20°C (-148/+68°F) dew point Readings to +30°C (+86°F) dew point	
Measurement Units	°C, °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)	°C, °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>v</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°C (0.18°F) dew point	
Typical Response Speed	t95 in ≤15 minutes to -60°C (-76°F) dew point	t95 in ≤30 minutes to -60°C (-76°F) dew point
Measurement System Repeatability	Better than ±0.1°C (0.18°F) dew point	
Measurement System Hysteresis	±0.05°C (0.09°F) 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	Up to 48 hours of typical usage between charges	Up to 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 (5076 psig) (Please consult your Michell Sales Engineer for advice on operating at pressure exceeding 150 barg/2175 psig)	
Operating Environment	Outdoors 0 to +100% RH condensing	
Operating Temperature	-20 to +50°C (-4 to +122°F)	
Storage/Transport Temperature	-40 to +70°C (-40 to +158°F)	
<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 1.2 NI/min (0.42 to 2.54 scfh)	0.2 to 0.5 NI/min (0.42 to 1.05 scfh)
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	218 x 170 x 90mm (d x w x h) (8.6 x 6.7 x 3.5 inches)	
Weight	1.35kg (2.98 lbs)	1.5kg (3.31 lbs)
<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)	
User Interface Languages	English, French, German, Italian, Portuguese, Spanish	
<b>Certification Codes</b>		
	CE	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

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

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