

# MicroView Mini Hygrometer Ex-d

## Trace-Level Moisture Analysis

### *ATEX/IECEX Certified for Hazardous Area Use*

When critical moisture analysis can only be made in a plant Hazardous Area, then the **MicroView Mini Hygrometer Ex-d** is integrated inside a certified Ex-d enclosure, ready for installation & commissioning.

For 40 years, MCM's unique **Temperature-Controlled Silicon Oxide sensor ["Si-Chip"]** has delivered a clarity of vision far beyond the capability of alternative hygrometer technologies, with a response speed and sensitivity that reveals process information in the type of fine detail that is otherwise invisible to other types of moisture analyser. In short, the MCM hygrometer provides real-time data and a level of accuracy unattained by any other moisture analyser technology.

Ideally suited to any hazardous area process application that requires precise moisture control in the sub parts per million [ppmV] range, not only does the **MicroView Mini Hygrometer Ex-d** deliver cutting edge analysis, it is also a dream for the process engineer and instrument technician. Ready to install direct from the box, the analyser has no complex setup, commissioning or operational requirements and is completely "self-managing" in all aspects of routine use. Compared to alternative hygrometers that require detailed programming of instrument parameters, precise control of sample conditions and inefficient maintenance interventions, the **MicroView Mini Hygrometer Ex-d** is the very definition of a "plug and play" analyser solution.

MCM is committed to the delivery of leading-edge hygrometer equipment, but we are also dedicated to the crucial foundations of traceable calibration standards. This is a unique position in the marketplace. Since our formation in 1968, MCM has pioneered advancements in calibration procedures. Developments include an ISO 17025 Primary Standard moisture generator that provides a "World First" accredited lowest moisture calibration traceability of *10 parts per billion* [ppbV], with uncertainty of  $\pm 2$  ppbV. Our 50+ years of innovation is testament to the dedication of our team; for you, the user, it reflects the value of dealing with specialists.



MicroView Mini Ex-d [Model:- MVMINI-Exd]



## Moisture Control & Measurement Ltd

Rudgate, Thorp Arch Estate

Wetherby, West Yorkshire, LS23 7AU

UNITED KINGDOM

t: +44 (0)1937 843927

e: [sales@mcm-moisture.com](mailto:sales@mcm-moisture.com)

w: [www.mcm-moisture.com](http://www.mcm-moisture.com)



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## The Need for High Quality Process Data

The collection of the highest quality process data is critical for the optimisation of any industrial application, be that in terms of product quality, productivity, profitability, extending maintenance schedules or plant health & safety. Choosing the correct moisture analyser can deliver enormous cost savings or, alternatively, specifying a poorly performing analyser can lead to significant unseen cost penalties.

By specifying a hygrometer with high performance and proven track record, the operator also gains the utmost confidence in the data that is provided, which allows critical decisions to be made quickly and with assurance. If the moisture analyser delivers a real-time response, then immediate interventions can be made in the event of process degradation or serious process upset.

## Typical Applications

The **MicroView Mini Ex-d Hygrometer** brings the highest standard of moisture analysis for critical hazardous area applications such as:- dryer outlet monitoring, H<sub>2</sub> electrolysis and sweet natural gas measurement. For any process with heavy hydrocarbons or other impurities, then the **MicroView Mini Ex-d Auto-Zero Hygrometer** provides added protection and measurement validation options. Contact MCM's Sales Application Team for more details.

## MCM's Technical Advantage

MCM's unique **Temperature-Controlled Silicon Oxide sensor ["Si-Chip"]** is unique within the industry and offers unrivalled speed of response, stability and repeatability of data.



Controlling the sensor at a fixed operating temperature [+45°C] gives faster measurement and enhanced sensitivity to changes in the process condition. The effects of contamination are reduced and effects of hysteresis are minimised. Unlike other types of hygrometer, there is no sensor "sleep mode".

## The Push Purge® Feature – In-Built Verification

The Push Purge® feature allows the sensor temperature to be elevated above the boiling point of water. MCM hygrometers automatically use Push Purge® as part of their built-in and fully automatic self-validation process. With Push Purge®, the validation happens by disturbing the equilibrium of the sensor, rather than the process, and without requiring any input from the operator.

## Summary of MCM Advantages

Whether you approach the topic of moisture analysis from the perspective of procurement, a design engineer or plant operative / management, MCM's leading hygrometer technology provides a proven "no-risk" solution. With a wide variety of compelling performance and commercial advantages, based on 50+ years of experience, the MCM solution is "*simple from start to finish*":-

### Advantages for the Buyer

- Value for money / low cost of ownership (CapEx & OpEx)
- Straightforward, fast & cost-effective to install
- No hidden buying costs – the analyser is ready out of the box
- Versatile – simple to specify, with no complex options list
- Long service interval & years of demonstrated reliability data

### Advantages for Engineers & Operators

- An analyser that delivers reliable data in "real-time"
- Provides proven and robust operation "in the field"
- Fast & simple installation, no long commissioning process
- No need for exact control of flow, pressure or gas temperature
- Low flow rate + fast sensor response = minimal gas wastage
- No routine spare parts requirement
- Install in remote plants – no local technical support is required
- ISO 17025 calibration option for maximum traceability
- Traceable calibration to 10 ppbV [±2 ppbV]
- Small footprint aids project design and plant upgrade projects



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## Seeing is Believing

There's a well-used saying that goes, "**A picture is worth a thousand words**". Some might say that the best images are worth much more and, in the high-tech world of trace moisture analysis, the value of accurate "pictures" can be \$ millions.

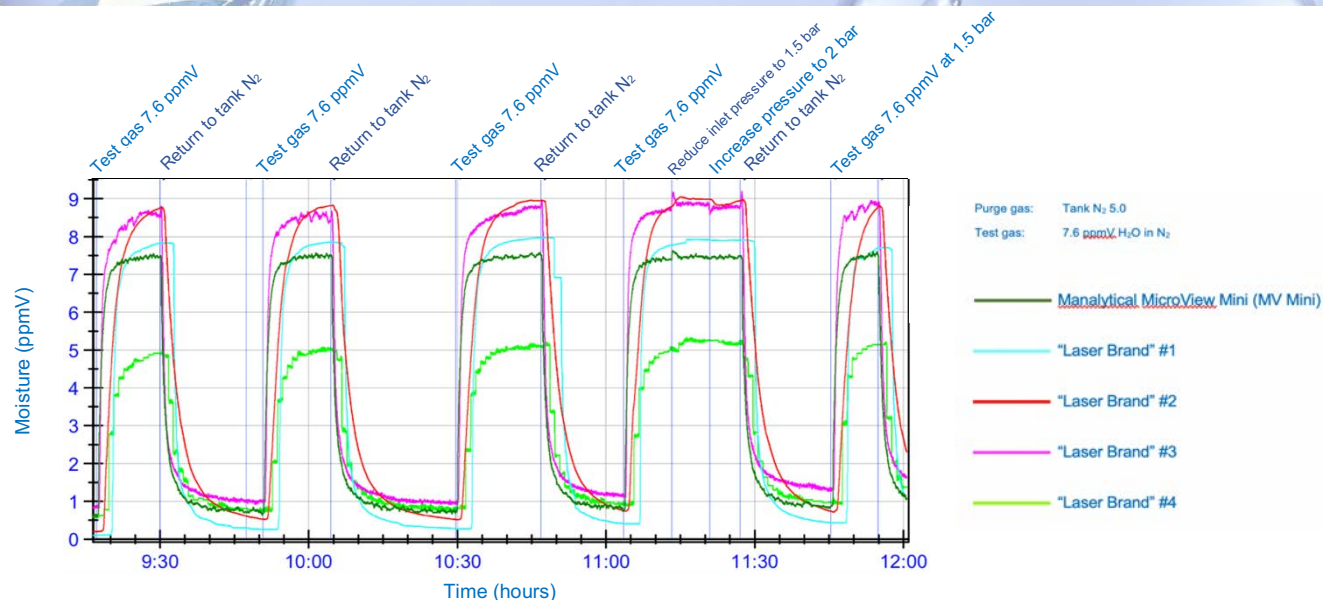
At MCM, we let our hygrometers speak for themselves by actively encouraging detailed product testing. Only by collecting actual performance data can we create the pictures, to which words alone cannot do justice.

For you, the user, this ethos is invaluable because it provides an instant visualisation of the capability of our technology.

The graphs on the following pages were produced by a world-renowned gas separation company, which performed an independent exercise to evaluate a number of different hygrometer technologies (the tests featured 4x Tunable Diode Laser (TDL) hygrometers and the **MCM MicroView Mini Hygrometer**).

The tests were conducted independently of the vendors to evaluate the accuracy, reproducibility and T90/T100 response times of the various analysers when exposed to differing purge and span gases.

These graphs act as "factually-based" pictures and speak volumes about the performance capability of the various technologies.



**The above tests involved cycling the 5x test hygrometers between the client's purge gas (Tank N2 5.0) and a certified standard at 7.6 ppmV (7600ppbV). Observations were made regarding accuracy, stability, repeatability and T90/T100 response times.**

- The recorded data shows a clear variability in the performance of the 4x TDL analysers (blue, red, pink, light green).
- The disparity of the data from the TDL devices shows not just a spread of moisture values, but also deficiencies in repeatability and stability. For example, all TDLs show a tendency to report wetter values on subsequent span tests and some show flat lines where others suggest that the readings are not stable.
- **The MCM MicroView Mini Hygrometer (dark green) shows not only the fastest response, but greatest repeatability and accuracy at the span-test of 7.6 ppmV.**

The variability in the readings of the TDL instruments dispels the myth that TDL technology provides "absolute" data, without the need for calibration. **The MCM MicroView Mini Hygrometer is confirmed as the fastest, most accurate, most stable and most repeatable device.**



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# MCM MVMINI Ex-d Specification Data

## Summary Ex-d Specification:-

**Certification:** ATEX/IECEX  
**Execution:** II 2 GD; Ex db IIC T4 Gb; Ex tb IIIC T135°C Db  
**Degree of Ingress Protection:** IP66  
**Ambient Temperature:** -20 to +60°C  
**External Painting:** RAL7038  
**Gas Inlet / Outlet:** 2x Ex-d Flame Arrestor FT-61090-8A  
**Drain Valve:** 1x VS-61090-4A, breathing/draining device AISI 316L  
**Cable Glands:** 1x Hawke 501/453/UNIV [power]; 1x Hawke ICG/653/UNIV [signal & alarm]  
**Cable Specification:** Includes 5m cable with each gland [for site termination]  
**Certification Label:** Included [affixed to outside of Ex-d enclosure]  
**Manufacturer's Ex-d Declaration of Conformity:** Included  
**External Dimensions:** 397mm W x 331mm H x 225 mm D  
**Viewing Window:** Ø185mm  
**Approximate Gross Weight:** 23kg



The MicroView Mini Hygrometer Ex-d can be supplied with or without an insulated & cooled enclosure and/or Ex-e junction boxes

## Summary MicroView Mini Ex-d Hygrometer Specification

**Sensor:** Silicon Oxide, temperature controlled for fixed measurement operation at +45°C. Removes errors of fluctuating process / ambient temperatures and reduces effects of hysteresis. Rapid response and high sensitivity.

**Analyser type:** Online with continuous measurement

**Measurement Range:** 0.1-100 ppmV (other ranges available upon request)

**LDL:** <0.1 ppmV      **Sensitivity:** 0.1 ppmV

**Accuracy & Calibration:** Subject to selected measurement range. Each sensor receives individual multi-point calibration in line with ISO 6145-8 and a statement of errors is published with each unique Certificate of Calibration. ISO17025 option offered for maximum traceability.

**Response Time:** Real-time response to changing conditions within seconds

**Inlet Pressure:** Atmospheric (pressure / flow regulation can be supplied)

**Exhaust Pressure:** Atmospheric vent (unrestricted)

**Sample Gas Flow Rate:** Flow independent. Recommended 0.5 litre/minute.

**Sample Gas Temperature:** Maximum +45°C

**Online Verification:** Automatic configuration checks on start-up plus routine periodic self-test diagnostic routines during normal operation, which maintain optimal performance.

**Power Supply:** 100-230V AC (maximum current 450mA)

**Output:** 4-20mA, loop driven [internal power], scaled over range 0-100 ppmV

**Alarms:** System / watchdog alarm to notify the operator if any hardware or software malfunction is detected.

**Reference Gas:** Not required. Automatic self-reference checks are performed through interaction between hygrometer firmware and sensor.



A range of standard & bespoke stands, frames and shelters are available

## Optional Enclosure

- Choice of IP ratings
- Insulated to cryogenic plant standards
- Vortex cooler
- Ex-e junction boxes for power/signal
- Approximate gross weight 38kg
- Dimensions [including cooler & Ex-e] 640mm W x 750mm H x 320 mm D



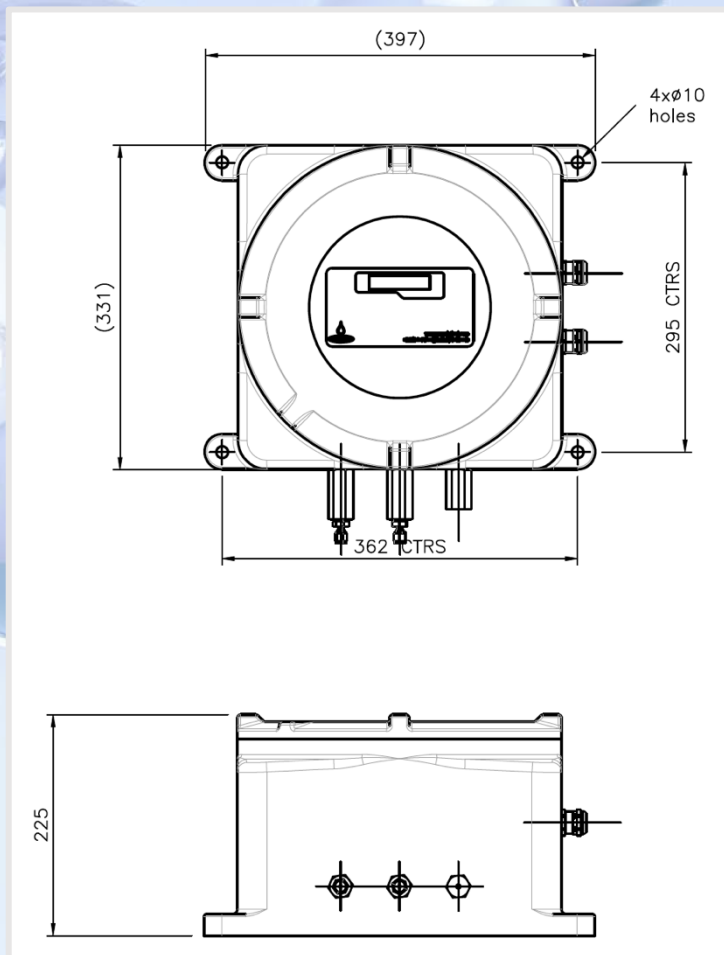
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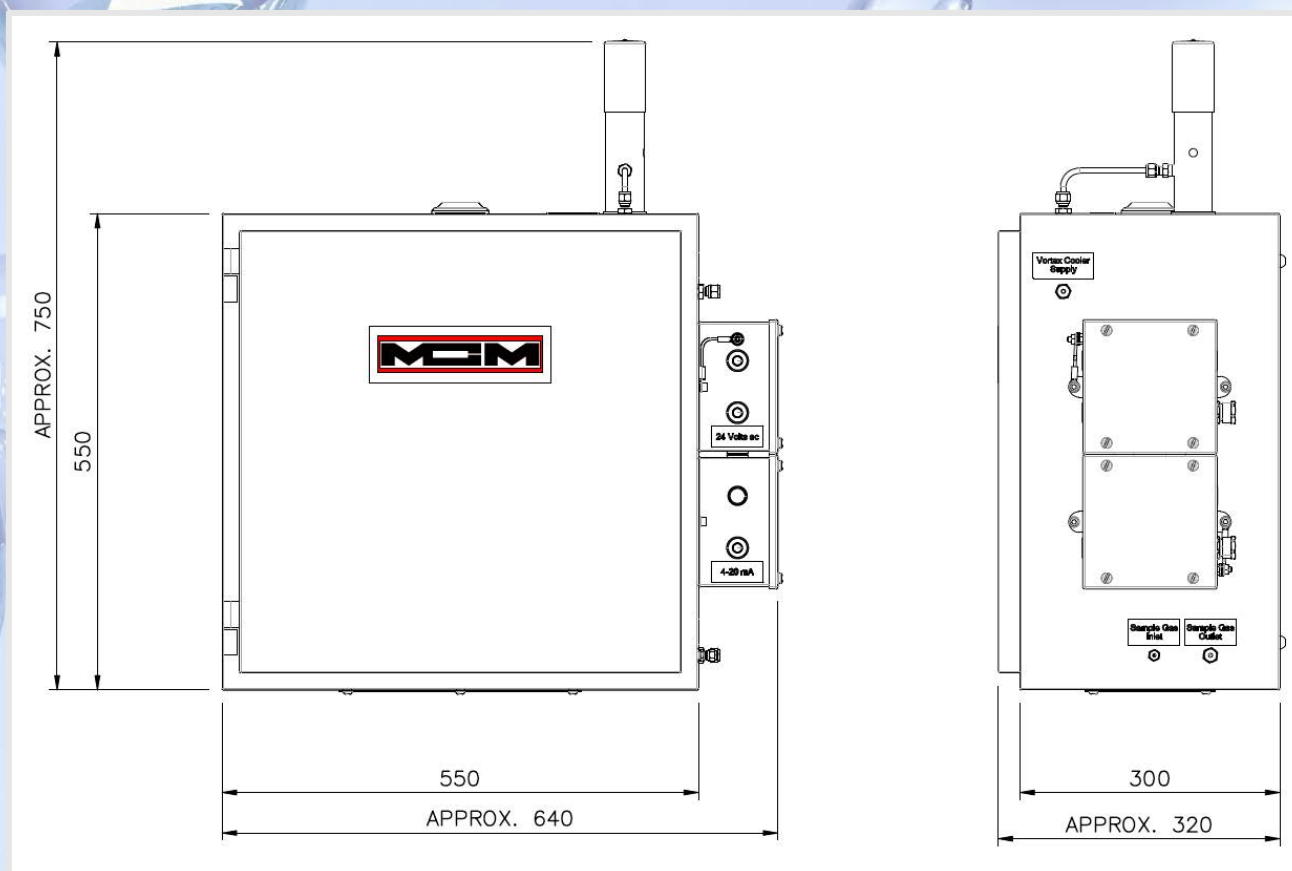
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# Proven Technology – Simple Operation – Low Cost – High Value



MicroView Mini Ex-d [Model:- MVMINI-Exd]  
Ready for panel or wall-mount in the application area.  
[Dimensions in mm]



The addition of MCM's optional cooled and insulated cabinet allows the MVMINI-Exd to be installed in environments with high ambient temperature. Mounting holes in the rear of the cabinet enable fixing to a wall or existing panel. Alternatively, MCM can supply a range of frames, shelters and stands.

The straightforward installation requires only electrical connections to the power/signal Ex-e junction boxes and sample gas inlet/vent connection. [Dimensions in mm]



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