

## **Manalytical**TRACE-3 Parts Per Billion Analysis

Would you like to see your process in the ultimate high-resolution detail?

If you believe the old adage that “*good things come in small packages*” then we agree with you and the **MicroView Mini Trace-3** is an outstanding example.

Based on Manalytical’s well-established Si-Chip moisture sensor, the MicroView Mini Trace-3 brings a new clarity of vision and unique insight for applications requiring precise control in the parts per billion [ppbV] moisture range. Quite simply, it represents the most significant evolutionary step in precision moisture determination in the last 25 years and provides a new level of performance for demanding industrial processes.

The existing MicroView Mini product line has developed a deserved reputation for quality of data, simplicity of use, reliability of operation and low cost of ownership. The new MicroView Mini Trace-3 builds on these robust foundations and delivers a unique high-resolution hygrometer that adds value to every level of your organisation.

With a 4-20mA output (loop-driven) linear over range of 0.1-1000 ppbV, resolution of 0.2 ppbV and unrivalled response to moisture excursions, the MicroView Mini Trace-3 gives you a level of detail that puts you in charge of your process. In short, the MicroView Mini Trace-3 provides real-time data and a level of accuracy unattained by any other technology.

Manalytical has always been at the forefront of the hygrometer industry and has pioneered advancements in calibration standards as well as measurement technology. These developments include ISO 17025 Primary Standard moisture generators with an accredited uncertainty of  $\pm 2$  ppbV – a world-first facility, which underpins the assured performance of your MicroView Mini Trace-3. Our 50 years of innovation is testament to the dedication and creativity of our team; for you, the user, it reflects the value of dealing with specialists.

### **Advantages for Design & Site Engineers**

- An analyser that delivers reliable data in real-time
- Provides proven and robust operation “in the field”
- Fast & simple install, no delay or commissioning costs
- No requirement for precise control of flow or pressure
- Versatile – compatible with a range of sample gases
- Small footprint aids project design
- ISO 17025 calibration option for maximum traceability

### **Advantages for the Buyer**

- Attractive pricing
- Simple, fast and cost-effective to install
- No hidden buying costs, analyser ready out of the box
- No additional costs of with complex sampling systems
- Standardisation – same analyser for many processes
- Long mean service interval
- Value for money / low cost of ownership

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 Manalytical, 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 **Manalytical MicroView Mini**).

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.

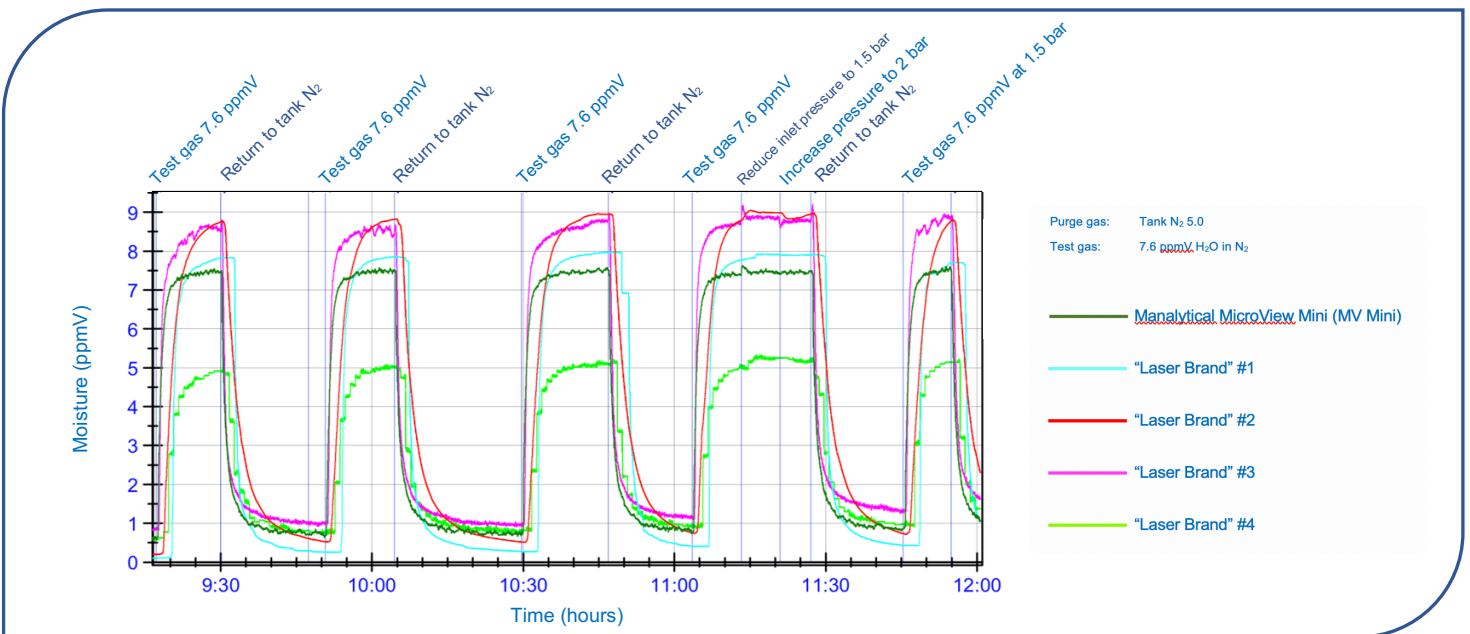


Manalytical MicroView Mini Trace-3 Hygrometer

### Specification Highlights

<b>Sensor Technology:</b>	Silicon sensor, temperature controlled to 30°C		
<b>Measurement Range:</b>	0.1 to 3000 ppbV	<b>Lower Detection Limit:</b>	0.1 ppbV
<b>Speed of Response:</b>	Response in seconds	<b>Calibration:</b>	In ppbV (ISO17025 optional)
<b>Installed Dimensions:</b>	237 x 108 x 50mm	<b>Installed Weight:</b>	1kg

**Graph 1:- Analysis of the Performance of 5x Competitive Hygrometers**  
1x Manalytical MicroView Mini Hygrometer, 4x Tunable Diode Laser (TDL) Hygrometers



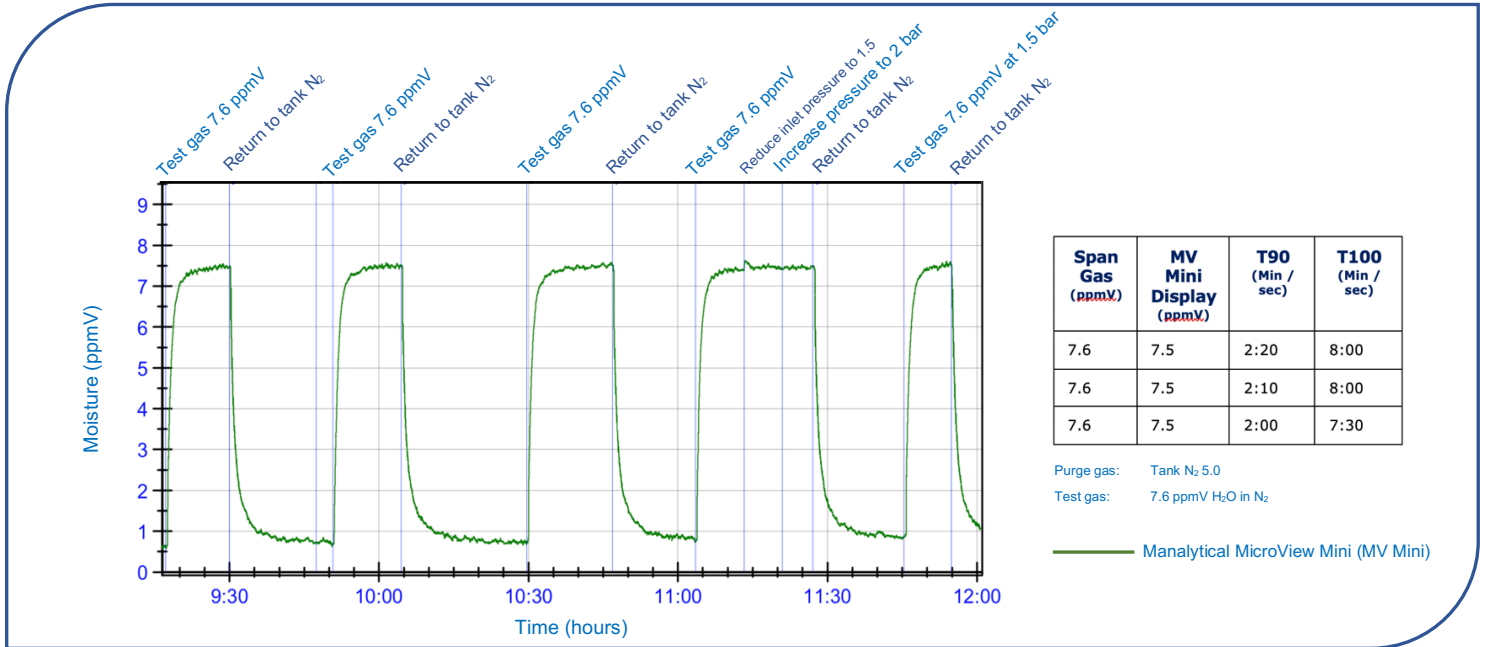
The tests involved cycling the hygrometers between the client's purge gas (Tank N2 5.0) and a certified standard at 7.6 ppmV (7600ppbV). Observations were made with regard to accuracy, stability, repeatability and T90/T100 response times.

- 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 **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 various TDL instruments clearly and finally dispels the myth that TDL technology provides "absolute" and reliable data, without the need for calibration. If such performance claims were true then all four of the TDL analysers should read exactly the same values on each test.

With this variability at ppmV levels, it is easy to imagine the difficulties for the user at lower ppbV levels unless accredited calibration data is available. Fortunately, with the **Manalytical Microview Mini Trace-3**, you have a secure ISO17025 calibration base potential.

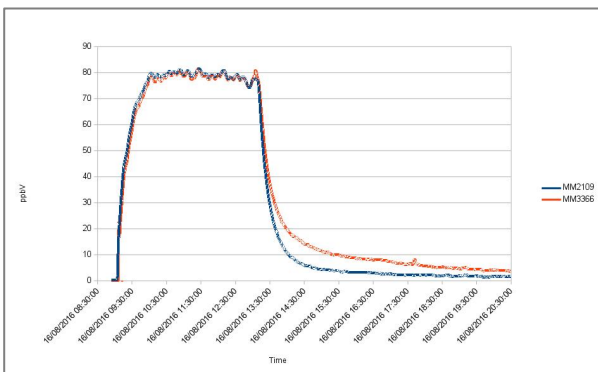
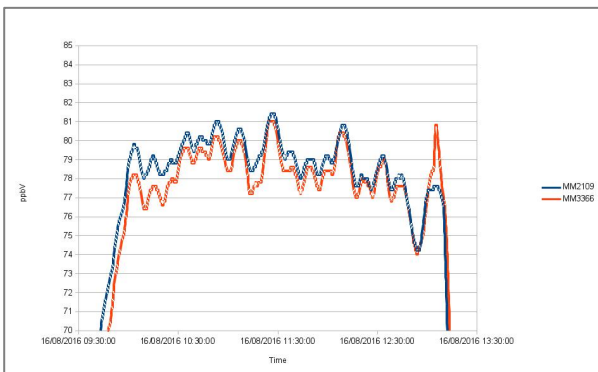
**Graph 2:- Extracted Data for the Manalytical MicroView Mini Hygrometer**



The above graph is extracted from Graph 1 and shows the performance of the MicroView Mini with comparative TDL traces removed.

- The trace shows excellent accuracy against the test standard, with error of 0.1 ppmV (100 ppbV). By comparison, the spread of the various TDL devices (Graph 1) shows errors of between 2.5 ppmV (2500 ppbV) under-reading and 1.5 ppmV (1500 ppbV) over-reading.
- The outstanding repeatability of the sensor is demonstrated by the **MicroView Mini** displaying a value of 7.5 ppmV for each test cycle. It is evident that the measurement does not return a higher value with each cycle between purge gas and span gas.
- Speed of response to T100 is measured at 8 minutes and with T90 achieved in under 2.5 minutes, providing huge productivity gains.

The fact that the **Manalytical MicroView Mini** outperformed all the other devices, whilst being in a significantly smaller package and at a better value proposition, vindicates our statement that "good things come in small packages". This pursuit of excellence is further demonstrated by our unique commitment to providing *traceable calibration* with ISO17025 accreditation at ppbV levels.



A pair of **Manalytical MicroView Mini Trace-3** hygrometers were calibrated at separate times and using different calibration rigs.

The hygrometers were soak-tested by Manalytical and the data recorded.

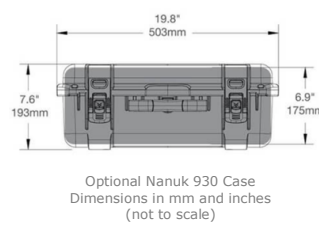
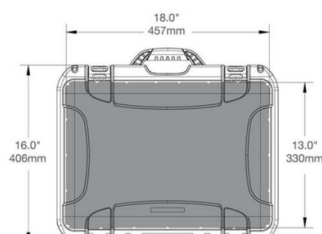
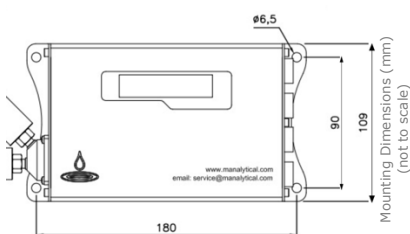
The graphs on the left show the two hygrometers measuring the same sample with moisture concentration in the range 77-80 ppbV.

The hygrometers can be seen to track one another within a maximum spread of 3 ppbV and with almost identical response times.

The **Manalytical MicroView Mini Trace-3** is ideally suited to applications requiring fast, accurate and reliable trace moisture analysis, including:-

- ASU Process Analysis
- Truck Fill
- Semiconductor
- Cylinder Quality Control
- Pharmaceutical

Key Performance Data	
Sensor Technology	Silicon sensor, temperature controlled to 30°C
Analyser Type	Online with continuous measurement
Measurement Range	0.1 to 3000 ppbV
Local Display Resolution	0.1 ppbV
LDL (Lower Detection Limit)	0.1 ppbV
Speed of response	Response to changing conditions within seconds
Drift	Negligible
Diagnostics	Automatic configuration checks on start-up Automatic, periodic self-test features during normal operation to ensure that optimal performance is maintained
Calibration	In ppbV (traceability to National Standards and ISO17025 is available)
Local Display	Alphanumeric LCD, displaying moisture data in ppbV
Sample Gas & Installation Requirements	
Sample gas flow rate	Flow independent. Recommended 0.1 to 0.4 litre / minute
Sample gas pressure	Atmospheric
Operating Temperature	-20 to +25°C (optimized for stable process and ambient conditions without rapid fluctuations)
Gas connections	Swagelok 316 Stainless Steel VCR Face Seal Fitting, 1/4 in. Female Nut (Part No. SS-4-VCR-1)
Power, Outputs & Alarms	
Power Supply	24V DC (maximum current 500mA)
Outputs	4-20mA (loop-driven), linear over range 0.1-1000 ppbV with resolution 0.2 ppbV
Alarms	System / watchdog alarm to notify operator when hardware or software malfunction is detected
Mounting & Physical Specifications	
Mounting	Free-standing (bench-top) or panel mount. Supplied with 4x 6.5mm $\phi$ mounting holes
Clearance Dimensions (for installation)	237mm wide x 108mm high x 50mm deep
Installed Weight	1.00kg
Clearance Dimensions (for transportation) With protective desiccant seals fitted to sensor chamber	405mm wide x 188mm high x 50mm deep
Weight for Transportation	1.80kg
Accessories	Optional Nanuk 930 IP67 Lightweight NK-7 resin case Includes polyurethane foam cutout for protection of hygrometer during transportation External case dimensions:- 237mm wide x 108mm high x 50mm deep Gross weight (packed with hygrometer):- 5.00kg



**Please note:**  
It is the policy of Manalytical Ltd to follow a process of constant product improvement. Manalytical Ltd reserves the right to change the specification of any product without notice. Whilst every effort has been made to ensure that the data in this brochure is accurate, the client should not rely on the content for the purposes of project design. The final specification for any delivered product will be determined by completion of an Application Filter, a copy of which can be provided upon request.



**Accredited**  
**ISO/IEC Guide 17025 – Since 1987**

**Providing certified calibrations**  
**with mass traceability to 0.02 ppm[V]**

**The highest level of calibration traceability is provided for applications requiring the most stringent level of accreditation and certification.**

All calibrations performed by Manalytical are traceable to Mass standards and performed in accordance with ISO 6145-8:2005.

For those applications that require the most demanding levels of certification, Manalytical’s partner laboratory can provide calibration that is traceable to 20 ppbV (uncertainty of ±2 ppbV), fully supported with ISO17025 accreditation.

Offering market-leading services since 1987, these facilities offer the lowest traceable moisture calibrations of any laboratory in the world.

To request this unparalleled calibration service for your process, quote “ISO17025 Calibration” when making your enquiry.

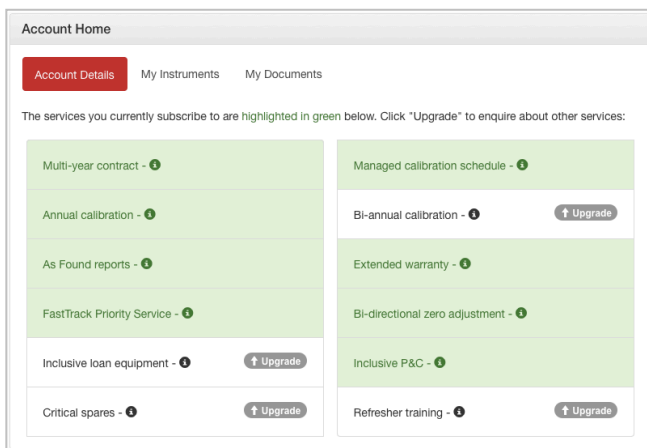


**Fixed-price Maintenance Contracts provide routine certified calibration, peace-of-mind support and compliance with local audit requirements.**

Subscribe to a Maintenance Contract from Manalytical and we will routinely check, calibrate and (if necessary) repair your hygrometers whilst managing a bespoke support schedule that is tailored to meet your requirements. Our team of knowledgeable and skilled technicians aim to provide minimal downtime combined with the highest levels of operator confidence. The service includes:-

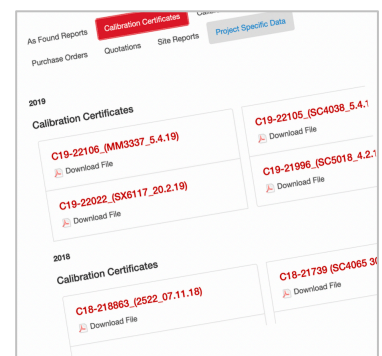
- Scheduled calibration service managed by a dedicated account manager
- Value-add extras: warranty, technical reports or priority service
- Options for inclusive spares (loan basis to ensure 24/7 operation)
- Multi-year agreements available, providing greatest value-for-money

Please contact your Manalytical representative to enquire or request a quotation.



**Our Online Resource Centre gives instant access to critical data about your Manalytical assets – available 24/7, wherever you are in the world.**

Navigate your account from the login homepage – check the details of all your Manalytical hygrometers (serial number, unit specification, installed location), confirm service contract options and download a full history of certificates, reports and other critical documents. Our Online Resource Centre provides everything you need to know, at the click of a button.



**FURTHER INFORMATION**

For more details please contact Manalytical or your local representative:-

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