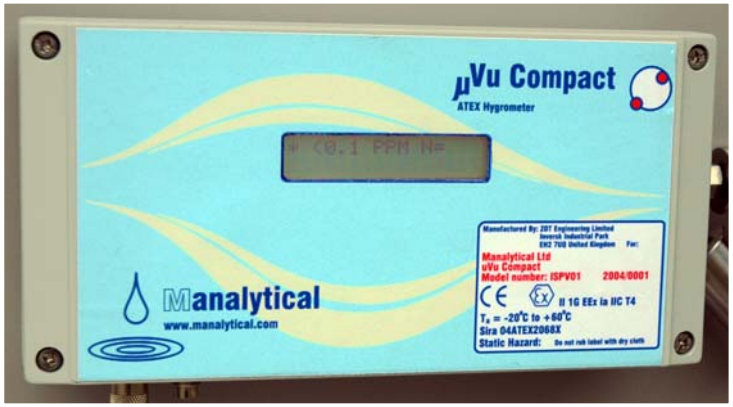



# Microview Compact ATEX Hygrometer

**Ⓔx II 1G EEx ia IIC T4 $T_a$ = -20ºC to +60ºC**

***MCM's ATEX On-Line Hygrometer Redefines Hazardous Area Applications!***

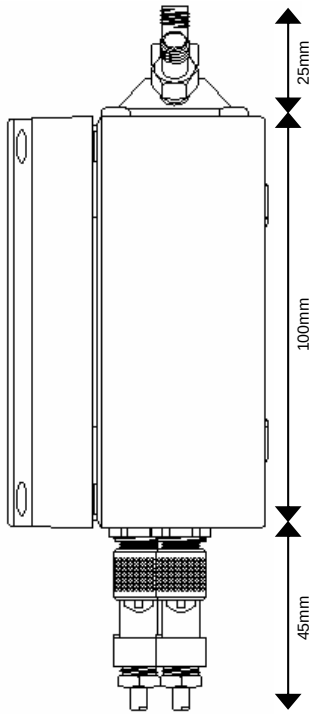
- Continuous on-line analysis ***or*** incorporate the Microview Compact in to an Auto-Zero, Self-Calibrating or Custom Design System, inside the Hazardous Area
- Ideal for Natural Gas and Petrochemical operations such as Offshore Platforms, Post-Glycol 'Contactor' Monitoring, Pipeline Drying, Natural Gas Storage & Distribution, Receiving Terminals (Custody Transfer), Refineries (Catalyst Protection), LPG Container Transfer
- Suitable for use with a wide variety of gases, including: Natural Gas, Methane, LNG / LPG, $H_2$, Ar, $O_2$, $N_2$, He, Air and Volatile Hydrocarbons (up to C5)

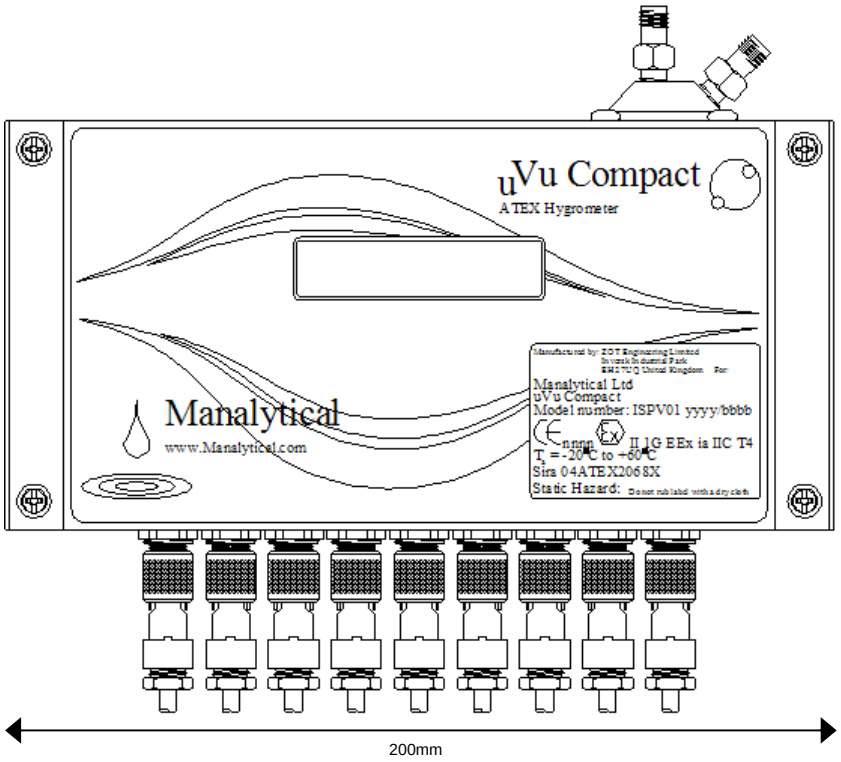
***Leaders In Moisture Technology***

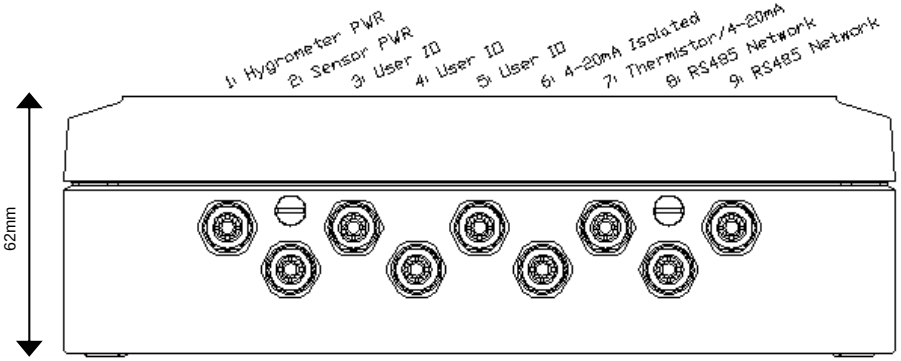
# MICROVIEW COMPACT ATEX HYGROMETER

## SPECIFICATION

| | |
|---|---|
| **Sensor Type:** | Temperature Controlled Silicon Sensor |
| **Sensor Housing:** | Stainless Steel 316, ⅛" ø pipework |
| **Sample Flow Rate:** | Flow independent, 0.05 - 1 litre / minute |
| **Operating Range:** | 1 to 1000 ppm[V] standard. Other ranges available upon request |
| **ATEX Rating:** | *II 1G EEx ia IIC T4 $T_a$ = -20ºC to +60ºC* |
| **Display:** | LCD with backlight |
| **Diagnostics:** | Automatic Push Purge® feature on start-up. Push Purge® confirms that the Sensor and electronics are operational and highlights contamination to the Sensor. Push Purge® confirms the speed of response of the instrument and validates readings on-line without disturbing the sample gas |
| **Response Time:** | Full scale 'wet' to 'dry' (1 ppm[V]) in <1 minute with Push Purge® |
| **Lower Detectable Limit:** | 1 ppm[V]. Resolution of 1 ppm[V]. Higher sensitivity available upon request |
| **Operating Conditions:** | -20 to +40ºC, R.H. up to 80% in non-condensing atmospheres |
| **Sample Gas Pressure:** | Atmospheric |
| **Power Supply:** | 12V DC. Loop Powered 4-20mA output supplied as standard |
| **Calibration:** | In ppm[V], traceable to National Standards |
| **Dimensions:** | 200mm wide x 100mm high x 62mm deep |
| **Weight:** | 1 kg approximately |

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# MicroView Compact ATEX Auto-Zero Hygrometer System

The MicroView Compact ATEX Auto-Zero Hygrometer System has been designed to offer a robust moisture analysis solution for exacting gas applications, where on-line analysis is required but where levels of contamination demand automatic intervention.

Contaminated sample gas will degrade the performance of any moisture sensor; the rate of degradation being dependent on the levels of contamination present. By comparison to known, 'dry' reference gas (supplied from MCM's Bottled Gas Dryer), the Auto-Zero System periodically tests the functionality of the instrument electronics and sensor to detect and re-index this degradation in performance back to a known reference condition.

The MicroView Compact ATEX Hygrometer retains MCM's unique Temperature Controlled Silicon Sensor and Push Purge® sensor heating feature. The Auto-Zero version is configured as a modular package that can be upgraded to a self-zeroing system without the need for costly remedial Plant engineering or instrument replacement.

MCM's technology advantages are:

1) ***Unrivalled speed of response***. Due to the physical properties of the heated ***Silicon Chip Sensor***, and its very small size, the sensor can recover from 'full scale wet' to less than 1 ppm[V] ('dry') within 2 minutes, using the Push Purge® sensor heating feature. This has practical benefits in the monitoring of dryer beds, recycle gas applications and in improving yield through process optimisation, where a speed of response advantage is most obvious.

2) ***Improved stability***, ***extended sensor life*** and ***traceability*** are possible due to ***Temperature Control*** of the sensor at 45ºC. Temperature Control gives MCM analysers direct traceability back to the calibration laboratory – the operating temperature of the sensor in the field is always the same as the operating temperature of the sensor when it is calibrated in the laboratory. Stability of data is excellent because the analyser is not affected by changes in process or ambient temperatures, unlike sensing technologies that do not utilise Temperature Control. ***MCM manufacture the only sensor with Temperature Control and a sensor drydown function (Push Purge®)***.

3) The ***Push Purge®*** sensor drydown function is unique to MCM. It allows the operator to assess the response speed and sensitivity of the sensor at the push of a button. By raising the temperature of the sensor to 130ºC, ***Push Purge®*** dries the sensor, before allowing it to return to an equilibrium condition with the sample gas. This approach ensures that each measurement is approached from a dry condition, hence eliminating hysteresis errors. ***Push Purge®*** offers an invaluable way to verify results (especially in a 'flat-line' sample condition), by confirming the electronic functionality of the analyser and the responsiveness of the sensor, at any time, without disturbing the sample.

4) The use of ***Push Purge®*** also confirms the presence of contamination in a sample gas and extends the life of the sensor by removing volatile contaminants (up to C5) which can be evaporated from the sensor at a temperature of 130ºC.

5) ***Push Purge®*** eliminates the very significant errors associated with hysteresis. By heating the sensor before every measurement, the MCM analyser approaches a reading from the 'dry' end of the scale, a patented feature offered by no other analyser. Errors of hysteresis, when a reading is approached either from the 'dry' or 'wet' end of the scale (see *BJ Process & Pipeline Services* report) can be as high as 500%!

***Lower Cost of Ownership***

MCM's Temperature Controlled Silicon Sensor is proven to be fast responding and robust, surviving in clean Natural Gas applications for at least three years and in some cases much longer. The reduction in the service / replacement costs compare very favourably with alternative, high maintenance technologies (such as Aluminium Oxide or Oscillating Crystal) where probes are

typically replaced every six months and where there is no continuity of performance data available when probes have been changed.

***More Reliable Data***

The Auto-Zero System is designed to extend the mean time between servicing, whilst at the same time periodic (weekly) auto-zeroing corrections maintain instrument readings within acceptable performance tolerances. This technology is particularly suited to low level monitoring while the 'zero' reference gas is close to the measured value and in which a zero shift will have significant impact on the quality of data collected.

Typical applications include LNG, dryer beds and process monitoring.

Items such as the Auto-Zero System valve tray and Bottled Gas Dryer can be easily serviced, by the client, without the need to send parts back to MCM. This compares favourably with alternatives which demand routine replacement of 'specialist' components that incur both additional cost and time delays.

MCM references in Natural Gas applications include:

- **Statoil** (offshore rigs, terminals)
- **Transco** (wet gas testing)
- **British Gas** (custody transfer)
- **Gasunie** (custody transfer)
- **Shell** (export pipeline)
- **Malaysia LNG** (*Twister* outlet, refinery, catalyst recycle gas)
- **Brunei LNG** (LNG, laboratory, process)

***A Simple Design***

By embedding all the system control functions in to the MicroView Compact ATEX Hygrometer we have eliminated the need for an external control unit to operate the Auto-Zero System. This change has simplified many aspects of system implementation and fault diagnosis. The MicroView Compact ATEX Hygrometer display gives readout in ppm[V] or Dewpoint ºC, as specified, and sends a linear, loop powered signal to the client, which they can use to trigger alarms and monitor the moisture trends remotely.

***Reduced Maintenance and Down Time***

The small size (200 mm x 100mm x 62mm) and weight (1kg) of the MicroView Compact ATEX Hygrometer simplifies shipment for any required servicing or repair. The need for site servicing is limited to unit replacement – costly on-site instrument validations are no longer required. The replacement of a MicroView Compact ATEX Hygrometer in the field can be performed by site personnel as the Auto-Zero System will 're-zero' itself upon start-up, hence eliminating the need for site adjustment of a new unit under normal operating conditions. Any site work from MCM can usually be limited to diagnosis and consultancy services.

***Complete Processing Power***

The MicroView Compact ATEX Hygrometer has the on-board processing power to control the Auto-Zero System functions, generate a local LCD display and provide a loop driven linearised 4-20mA output analogue signal powered through Zener Barriers to the designated Safe Area. No external control unit is required and alarms can be configured from the client's DCS system.

***Low Risk Strategy – Upgrade only as Necessary***

Clients can select a lower level of sophistication at the time of purchase yet upgrade without penalty if the application is subsequently found to be more demanding than originally anticipated. The customer will pay only for the required work associated with providing the upgrade – a new system solution will, in the majority of cases, not be required.

MCM are able to propose a commercially low risk strategy to clients because the concept has evolved from practical experiences gained from various gas compositions. ***Although we will always propose the most suitable solution for each application, our modular approach allows the user to select the level of risk he is willing to accept***.

At the time of order, by specifying a larger system cabinet and extra wiring capacity, then a 'plug and play' upgrade can be enabled with little disruption to the Plant. A pre-built 'dry' gas generator and valve mechanism can be fitted in to the (pre-specified) enclosure, together with an EPROM to enable the software already installed in the MicroView Compact ATEX Hygrometer to perform its Auto-Zero function on a weekly basis. This provides security for the client because a cost-effective upgrade can be quickly obtained and installed, if necessary, without undue remedial engineering work.