QMA2030

Process Moisture Analyzer

A high-precision, fast-responding analyzer, which utilises advanced quartz crystal microbalance technology to offer drift-free measurement for a wide range of applications – from high purity industrial gases to catalyst bed protection.

Highlights

- **High accuracy**
  From 5% in the range 0.5 to 700 ppm_V
- **Wide operating range**
  0.1 to 2000 ppm_V
- **Extremely fast**
  less than 2 minutes for 63% response to a step change in either direction
- **Quartz Crystal Microbalance** technology for drift-free measurements with low sensitivity to contamination
- **Automatic calibration**
  for measurement confidence
- **Intuitive touch-screen**
  easy to use front panel display
- **Low cost of ownership**
  simple maintenance

Applications

- High purity gas production
- Industrial gas production
- Electronic gases
- Air separation plants
- Catalyst bed protection
- Semiconductor grade gases
- Cylinder gases
- Speciality gases
- Process dryers
- Hydrocarbon gases
- And many more...

QMA2030 Process Moisture Analyzer

The QMA2030 Process Moisture Analyzer is designed to provide highly reliable, fast and accurate measurement of trace levels of moisture content (ppb_V and ppm_V) in a wide variety of industrial applications where the direct measurement of true concentration of water molecules is of concern. The applied quartz crystal microbalance technology can directly measure the volume concentration of water as an impurity in a process gas.

For self-verification and diagnostics the analyzer incorporates automatic calibration using an internal reference source. The intuitive touch screen control panel provides easy operation. In addition, live measurement data and system information is always on view and the analyzer also has a data logging facility that allows trend data to be downloaded to an external USB storage device for analysis. On-screen alarms can be set at user defined levels. Alarm contacts, and a 4-20mA analogue output are provided for connection to external monitoring.

Features

Wide operating range helps control processes

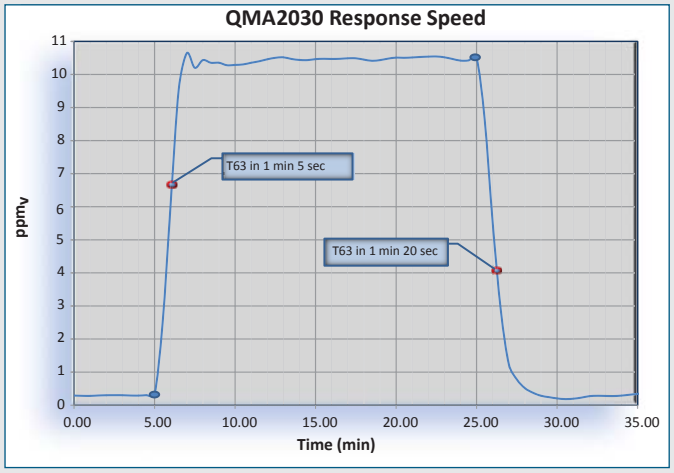
The wide operating range – from 0.1 to 2000 ppm_V – and fast response of the QMA2030 helps users to monitor and protect processes. A high moisture event can damage processing tools or finished products. It can indicate a failure upstream in air and gas separation plants. The QMA2030 can track high moisture events in real time and help quantify the size and duration of a moisture excursion, provide important information on gas delivery systems and even help prevent moist gas from reaching critical parts of the process.

Outstanding accuracy

Michell's advanced quartz crystal technology, developed and refined over many years, produces a highly reproducible and linear response to changes in moisture content. This allows the QMA2030 to deliver typical accuracy of less than 10% of measured value in the range 0.5 to 700ppm_V (±5% on request).

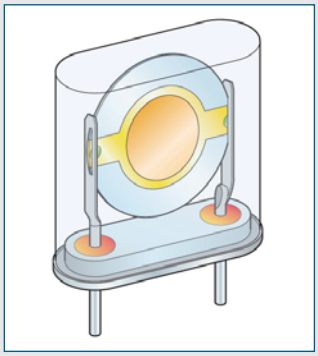
Excellent response speed through innovative engineering

Traditional sensor technologies are slow to respond in the trace moisture region. The QMA2030 is different. The highly responsive sensor, coupled with a volume-optimized internal sampling system means that the QMA2030 will give a 63% response to a step change in moisture in less than 2 minutes, more than twice the speed of comparable QCM analyzers. 95% response is achieved in less than 5 minutes, as the graph below left demonstrates.



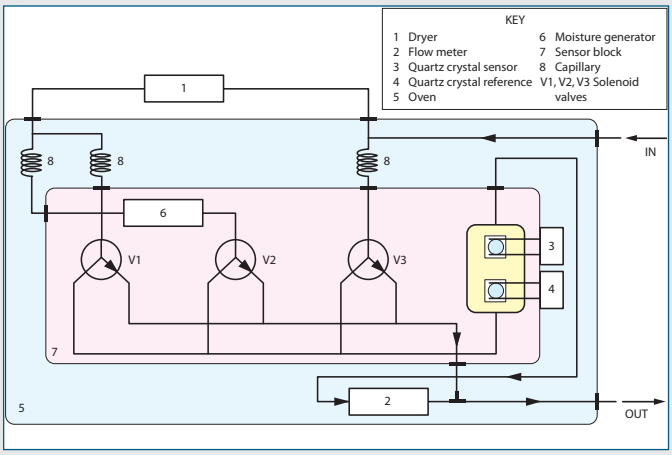
Advanced quartz crystal microbalance technology

Our engineers have spent many years developing and optimizing the performance of the Michell QCM sensor. This new generation sensor provides improved response, reproducibility and lower sensitivity to contamination than other available trace moisture analyzers. Water molecules are adsorbed into the moisture sensitive layer deposited on the crystal surface and the resulting change in mass modifies, in a very precise and repeatable manner, the frequency of oscillation. The design and manufacturing quality of the Michell QCM sensor is the key to the high performance level of the QMA2030.



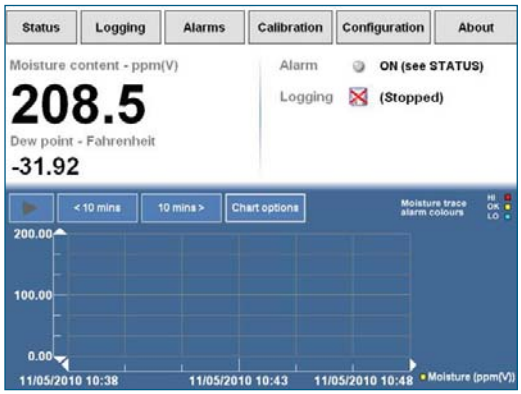
Automatic calibration for complete measurement confidence

The QMA2030 incorporates a fully automatic, self-contained calibration system for complete user confidence. The internal gas handling circuit comprises a gas dryer, moisture generator, sensor block sample housing and sensor cell, along with capillary flow control, flow meter and solenoid valves.
The critical components – moisture generator, sensor and flow parts – are precisely temperature-controlled. Periodic calibration checks of sensor performance can be initiated automatically (at user defined intervals and time of day) or manually on demand, providing a zero and span verification of instrument performance and automatically adjusting out any change. The moisture generator is calibrated traceable to NPL and NIST. During an internal calibration cycle, the Data Hold function will prevent any interruption of dependant processes by holding the analogue outputs at the same level for the duration of the calibration.

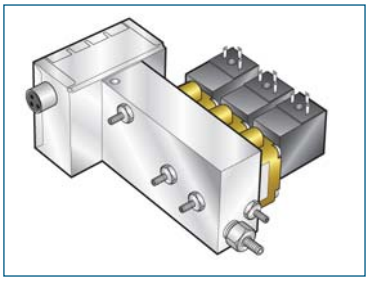


User friendly operation – precision made easy

Michell Instruments continues to stretch the boundaries in moisture measurement technology, providing innovative solutions that improve process efficiency and are simple to use. The QMA2030 touch-sensitive LCD display has been tested and endorsed by leading industrial gas manufacturers who value the easy set-up, control, display and datalogging options of the instrument. Not only can users view live data and graphical trends on screen, up to 14,000 measurement points, with varying time intervals, can be logged and downloaded to a PC via USB for further analysis.



Simple maintenance – reduced lifetime cost

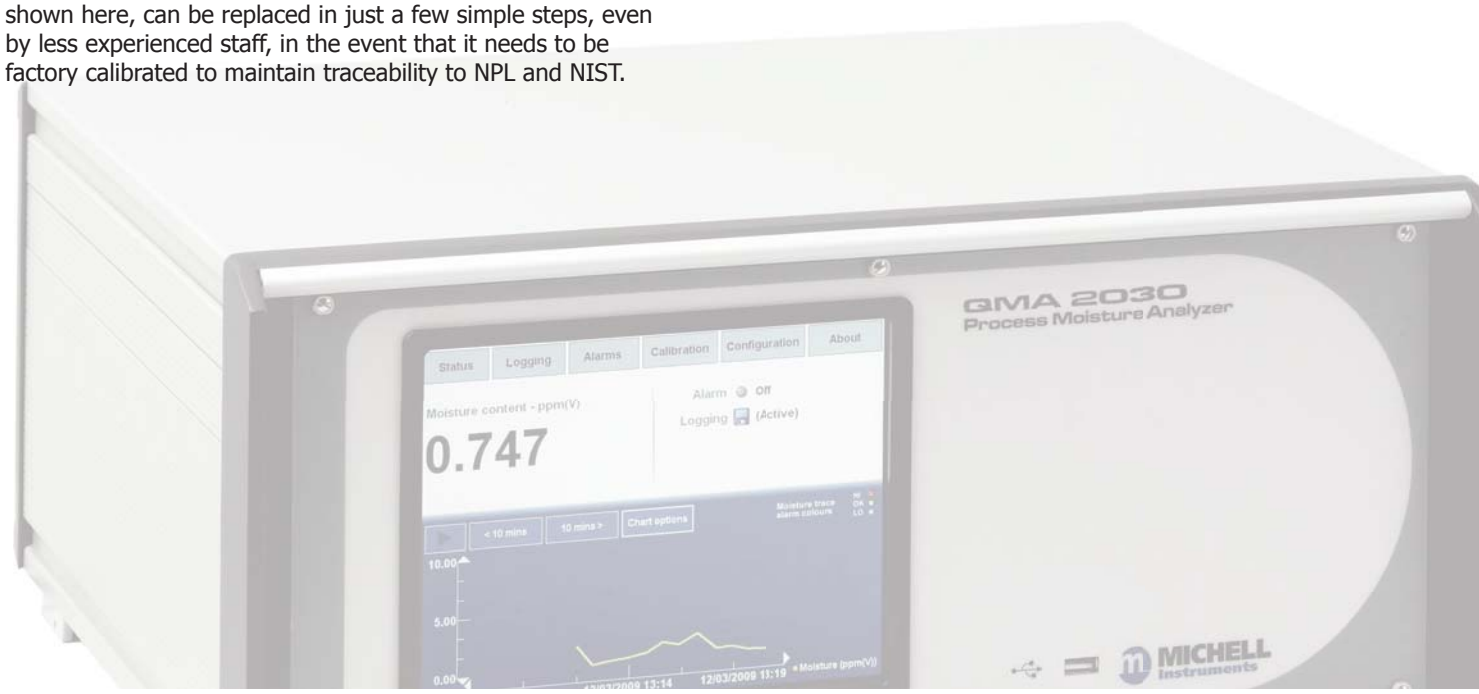


Sophisticated instruments are often complicated and require experience and special care in use, increasing cost of ownership. Michell Instruments cares not only about ease of operation, but also about ease and cost-effectiveness of maintenance. The QMA2030 is designed such that the integrated sensor block, shown here, can be replaced in just a few simple steps, even by less experienced staff, in the event that it needs to be factory calibrated to maintain traceability to NPL and NIST.

Enhanced Flowmeter Option

The QMA 2030 includes a flow sensor as standard, which is incorporated into the same temperature control system as the sampling system. A Gas density compensation table is provided in the software to allow selection of flows for a number of different gases.

For applications involving measurement of a complex mixture of gases, the QMA-MFM option can now be specified. This mass flow meter offers greater precision of measurement and selection of compensation factors for multiple gases.



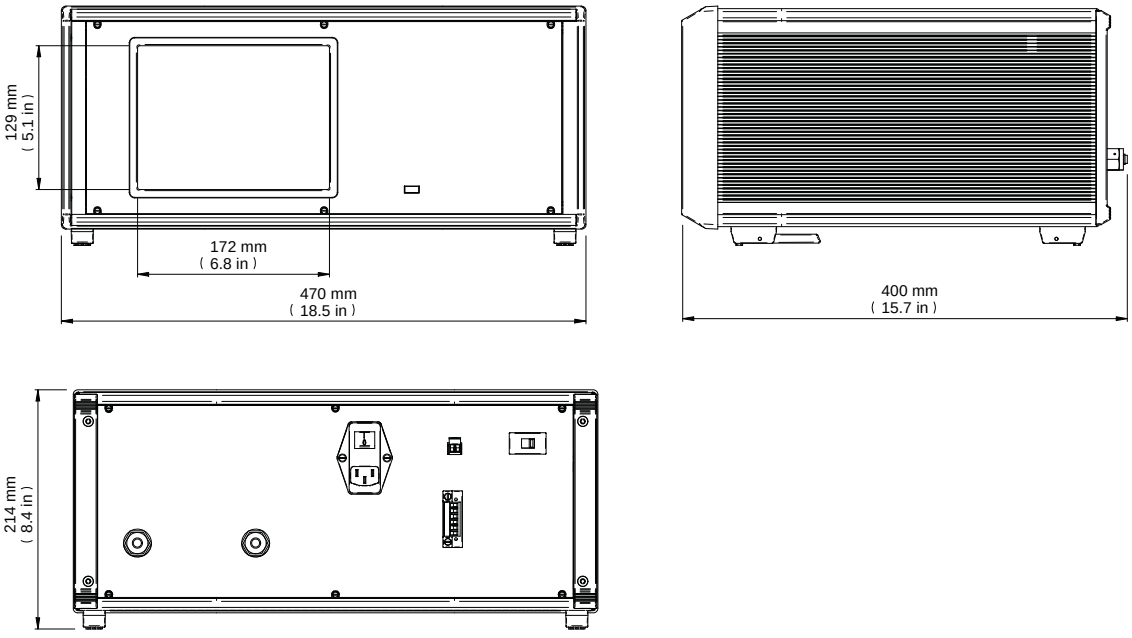
MICHELL Instruments

Technical Specifications

Performance	
Measurement technology	Quartz Crystal Microbalance
Range	0.1 to 2000ppm$_V$. Calibrated range 0.5 to 700ppm$_V$ with trend indication above and below calibration range
Accuracy	±10% max for 0.5 to 700 ppm$_V$ or 0.1 ppm$_V$ whichever is greater (±5% available on request)
Repeatability	±5% of the reading from 0.5 to 700ppm$_V$
Sensitivity	0.1ppm$_V$ or 1% of the reading, whichever is the greater
Response time	<2 minutes for 63% response to a step change in either direction <5 minutes for 95% response to a step change in either direction
Automatic calibration	Internal moisture generator source calibrated traceable to NPL and NIST
Electrical output / input	
Analog output	4–20mA for moisture (max load 500Ω) User-configurable range
Analog output resolution	16 bit
Supply voltage	110 V (90 to 115) or 240 V (220 to 245) switch selectable, 50-60 Hz
Alarms	3 Alarms: Volt free contact, rating 3A@250 V AC

Operating conditions	
Inlet pressure	1 barg (Adjusted to achieve the correct exhaust flow, up to 200 barg with optional pressure regulator)
Outlet pressure	Atmospheric
Sample flow requirement	300ml/min
Sample gas temperature	0°C to 100°C
Operating environment	15°C to 40°C, 90%RH max
Mechanical specification	
Display	8.4 inch LCD touch-screen
Dimensions (WxHxD)	470mm x 214mm x 400mm – allow extra 200mm for clearance at back (w x h x d)
Net weight	15kg

Dimensions



Michell Instruments Ltd 48 Lancaster Way Business Park, Ely, Cambridgeshire, CB6 3NW
Tel: +44 (0) 1353 658000, Fax: +44 (0) 1353 658199, Email: uk.info@michell.com, Web: www.michell.com/uk

Michell Instruments adopts a continuous development programme which sometimes necessitates specification changes without notice.
Issue no: QMA2030_97148_V4_UK_0611