

Model 3050-AP Moisture Analyzer

Quartz Crystal Microbalance Technology: Accurate. Reliable. Durable.

Welcome to the New World of Process Moisture Monitoring

The Model 3050-AP measures trace levels of moisture in a gas through the use of a quartz-crystal oscillator sample cell. AMETEK is the leader in quartz-crystal technology, which for thirty years has offered significant advantages over other measurement techniques:

- II It is the most accurate trace moisture measurement technology available.
- II It responds far faster to both increasing and decreasing moisture levels.
- II It is specific to moisture in most applications.
- II It provides a much more rugged sensor.

Because of these advantages, the quartz-crystal oscillator has become the industry standard for applications ranging from ultra high purity semiconductor gases to natural gas streams containing 30% H₂S. Now, the 3050-AP moisture transmitter brings the benefits of quartz-crystal technology to a broad spectrum of general, non-hazardous applications.

Direct Measurement of Concentration

The Model 3050-AP measures moisture concentration directly, in

parts-per-million by volume, parts-per-million by weight, or mass-of-water per standard volume without additional pressure or temperature compensation. For customers who wish to convert concentration to dew point, the 3050-AP can be programmed for a live process pressure input or a fixed pressure.

The Quartz Crystal Sensor

The heart of the 3050-AP analyzer is a quartz crystal microbalance (QCM) sensor and sampling system developed by AMETEK specifically for highly accurate moisture measurements. The sensor consists of a quartz crystal disc coated with a hygroscopic polymer. As the amount of moisture sorbed onto the polymer varies, the mass of the QCM changes, producing a corresponding change in the frequency of oscillation. The accuracy of the 3050-AP is an amazing 0.1 ppmv or 10% of reading, whichever is greater. Compare this to the typical accuracy of a hygrometer.

Unique Sampling System

The 3050-AP will never be a drain on the gas supply of your process. The analyzer delivers an excellent speed of response while consuming less than 100 sccm sample gas. In



addition, the design of the 3050-AP provides two operating modes: its normal measurement mode and a sensor saver mode.

Normally, the 3050-AP provides a fast and accurate analysis of the sample gas's moisture concentration while quickly cycling between the sample gas and a dry reference gas created from sample gas passing through the supplied dryer. If contaminants are a concern in your application, the 3050-AP can be operated in its sensor saver mode and equipped with a contaminant trap prior to the dryer. This configuration allows the sensor to see the contaminant free reference gas for an extended period of time. Therefore, the sensor is exposed to less contamination directly resulting in a longer sensor life.

Long-Term Stability and Reliability

Quartz is a far less reactive material than those used by other technologies and it is, therefore, more resistant to contamination. Quartz crystal oscillators are inherently very stable which is why they are used as a basis for time measurement – the quartz clock. Because of the superiority of this technology, you will see a longer sensor life with more stable, more accurate performance.

Actual Moisture Content PPMv	Model 3050-AP Accuracy	Aluminum Oxide Probe Accuracy ±2°C for dew points ≥ -65°C and ±3°C for below
1	± 10% of Reading	+59.6% / - 38.2% of Reading
5	± 10% of Reading	+52.4% / -35.2% of Reading
10	± 10% of Reading	+30.9% / -24.0% of Reading
20	± 10% of Reading	+29.3% / -23.0% of Reading
50	± 10% of Reading	+27.2% / -21.8% of Reading
100	± 10% of Reading	+25.7% / -20.8% of Reading

* Dew point conversions are referenced to 14.7 psia

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Performance Specifications

Technology: Quartz Crystal Microbalance

Range: Calibrated from 1 to 2500 parts-per-million by volume (ppmv). Readout capability in ppmw, lb/mmscf, mg/Nm³, and dewpoint in °C or °F (requires process pressure as an input)

Reference Gas: Continuously produced using actual sample gas

Accuracy: 10% of reading from 1 to 2500 ppmv with standard calibration; special calibration ranges not required

Reproducibility: 5.0% of reading from 1 to 2500 ppmv

Limits of Detection: 0.1 ppmv

Reliability: No routine factory calibration required due to highly stable and reliable nature of QCM sensor

QCM Response Time: Near real time. Computer-enhanced response, which may lead to errors, is not required to obtain quick wet-up or dry-down response

Sensitivity: 0.1 ppmv or 1% of reading, whichever is greater

Allowable Inlet Pressure: 1.3 to 3.3 Bar (20 to 50 psig) up to 200 Barg (3000 psig) with optional pressure reducer; analyzer performance is independent of process pressure

Exhaust Pressure: Atmospheric

Sample Gas Temperature: 0 to 100 °C (32 to 212 °F); analyzer performance is immune to changes in sample gas temperature

Gas Flow Requirements: <100 sccm

Outputs: Isolated 4 to 20 mA analog signal, keyboard selectable; 12 bit (0.025%) resolution, RS-232 and RS-485 serial communication ports

Alarms: Three contact closures; system alarm, data invalid alarm and concentration alarm

Ambient Temperature Limits
Analyzer: 5 to 50 °C (11 to 122 °F)

Voltage/Power Requirements
Analyzer: 24 VDC, 60 watts

Approvals and Certifications
UL/CSA/CE for non-hazardous areas

Other approvals pending at time of printing

MOISTURE



455 Corporate Blvd., Newark, DE 19702
Ph. +1-302-456-4400, Fax +1-302-456-4444
www.ametekpi.com



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One of a family of innovative process analyzer solutions from AMETEK Process Instruments.
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SALES AND MANUFACTURING:

USA - Oklahoma
2001 N. Indianwood Ave., Broken Arrow OK 74012 • Tel: +1-918-250-7200, Fax: +1-918-459-0165

USA - Pennsylvania
150 Freeport Road, Pittsburgh PA 15238 • Tel: +1-412-828-9040, Fax: +1-412-826-0399

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