

## Model 5920 Moisture Analyzer

### Benefits

- || Quartz-crystal technology provides accuracy, speed, and calibration stability
- || On-line zero-gas verification confirms analytical stability
- || Intuitive, easy-to-use interface with keypad and display allows access to operating variables
- || Rack-mount design makes the analyzer ideal for analytical carts
- || Menu-driven gas selection eliminates all manual adjustments

Building upon the success of our quartz-crystal moisture measurement technology, AMETEK's Model 5920 is an easy-to-use process moisture analyzer that offers a truly remarkable combination of performance features: multi-gas compatibility, exceptional accuracy, on-line verification, fast response speed, and wide measurement range.

The 5920 is ideal for critical moisture measurement applications including high purity gas production and semiconductor gases. Equipped with an on-line verification system, this state-of-the-art analyzer is designed to rapidly build and maintain operator confidence in its analyses. The verification system allows you to challenge the analyzer's sensor at will using a zero gas to check its baseline stability to confirm the sensor's stability and sensitivity to low ppbv moisture concentrations.



### Superior performance

#### *Multi-gas compatibility*

The Model 5920 combines the excellent multi-gas compatibility of the proven Model 5900 with a new, easy-to-use operator interface. A single, simple menu selection is all that is needed to re-configure the 5920 for a new gas type. There are no other necessary adjustments on the analyzer.

So, if you want to analyze industrial, high purity, or semiconductor grade gases and need an instrument that is compatible with virtually all bulk, ultra-high purity gases including inerts (He, Ar, Ne, Xe, Kr), H<sub>2</sub>, O<sub>2</sub>, and N<sub>2</sub>, turn to the Model 5920.

#### *Exceptional accuracy*

The Model 5920 is perfect for moisture applications that require stable and accurate results. The accuracy of this analyzer,  $\pm 1$  ppbv or  $\pm 10\%$  of reading, is exceptional. Quartz-crystal technology and an on-line verification system combine to constantly provide assurance that the analyzer is continuing to provide you with this superior level of performance.

#### *On-line zero-gas verification confirms analytical stability*

The on-line verification system in the 5920 uses an internal zero verification system. The zero verification system strips the moisture from the sample gas prior to analysis by the sensor. This allows you to verify the zero point of the sensor's calibration enhancing accuracy and confidence in ppbv measurements. This system is entirely internal to the analyzer eliminating the need to

break process connections along with the "wet-up" that would occur from ambient moisture. An alarm contact alerts the operator if the analyzer fails verification. The verification sequences can be started on a programmable schedule or on manual demand.

#### *Fast response speed*

The Model 5920 responds quickly to both increases and decreases in moisture concentration because the analyzer employs a unique non-equilibrium measurement technique. This technique continuously exposes the sensor to wet sample gas followed by dry sample gas to make its analysis. With this technique, the analyzer never needs to wait for the sensor to reach equilibrium to establish its accurate measurement. Importantly, this technique is based upon the defined, repeatable physical properties of moisture transport to/from the sensor's surface. This means that quartz-crystal technology never consumes gross quantities of valuable gas nor does it employ questionable prediction software as is often used to "speed-up" the apparent response speeds of other, more limited technologies.

AMETEK's unique technique makes possible accurate moisture readings far faster than would be possible under equilibrium, or continuous, operating conditions.

#### *Wide measurement range*

The Model 5920 accurately measures from 1 ppbv to 150 ppbv. While this is the recommended operating range, the analyzer will provide trend indication up to 1000 ppbv so that you can capture the nature of a process upset.

### The Quartz-Crystal Sensor

The heart of the 5920 analyzer is a quartz-crystal microbalance (QCM) sensor and analysis technique developed by AMETEK specifically for highly accurate moisture measurements. The sensor consists of a pair of electrodes that support the QCM sensor. When voltage is applied to the sensor, a very stable oscillation occurs.

The faces of the oscillator are covered 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. These easily measurable changes have a direct relation to the moisture concentration of the sample gas.

# Model 5920 Moisture Analyzer

## Typical Applications

### Continuous monitoring

Continuous moisture analysis is a valuable tool for quality assurance and process monitoring. As a quality assurance analyzer, the Model 5920 verifies that specified gas purity levels are maintained at on-site separation, bulk delivery and distribution system transfer points, and, ultimately, at points-of-use. The Model 5920 satisfies all the demands of continuous monitoring, principally low detection limit, high measurement accuracy, and internal verification.

### Spot monitoring

The Model 5920 is the perfect analyzer for temporary monitoring applications for verifying installation, maintenance, or repair of gas distribution systems. Such temporary or spot testing makes excellent use of the unique combination of capabilities provided by the Model 5920: very fast response speed, especially to decreasing moisture concentrations for monitoring system dry-down; complete compatibility with oxygen, hydrogen, and inerts; rapid start-up response; and the ability to quickly change from one gas to another.

### Cylinder gases

As cylinders are emptied, the drop in gas pressure causes an increase in moisture content in the remaining product. Consequently, many users change cylinders based on remaining pressure or weight. Because neither method directly measures moisture content, either expensive gas is wasted or impure gas enters the distribution system. The Model 5920's low sample flow requirement and multi-gas compatibility is ideal for assessing the purity of cylinder gases.

## Performance Specifications

**Compatible Gases:** Inerts (He, Ar, Ne, Xe, Kr), H<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>  
(Contact the factory to confirm compatibility with other gases.)

**Range:** 0 to 150 ppbv. Trend indication to 1000 ppbv

**Limit of Detection:** 1.0 ppbv nominal

**Accuracy:** ±1 ppbv or ±10% of the reading, whichever is greater

**Sensitivity:** Better than 1 ppbv

**Response Time:** 80% of a 25 ppb step change in either direction in less than 10 minutes

**Inlet Pressure:** 138 to 345 kPa (20 to 50 psig). Specified performance is obtained when the inlet gas pressure is maintained within ±17 kPa (±2.5 psi).

**Exhaust Pressure:** Atmospheric

**Sample Flow Requirement:** <0.5 slpm

**Inlet Gas Temperature:** 0° to 100°C (32° to 212°F). Optimal results are obtained when the inlet gas temperature is maintained at 60°C (140°F).

### Outputs

Four-line by twenty-character LCD display

One self-powered 4 to 20 mA, into 100 to 500 ohm load analog output; can be configured for loop-powered operation

RS485 and RS232 serial ports

**Alarms:** System alarm, concentration alarm, and data valid 30 VAC or 60 VDC max, 50 VA or 1A max, resistive

### Environmental Conditions

Ambient temperature range 10° to 30°C (50° to 86°F).

Optimal results are obtained when ambient is maintained within ±5°C (±9°F).

Relative humidity 90%, noncondensing

Pollution Degree 2

Maximum altitude 2,000 meters (6,560 feet)

Installation Category II

Indoor use only

### Utility Requirements

100 - 132 VAC or 230 VAC ±10%, 47-63 Hz, 185W

Instrument Air: 550 to 690 kPa (80 to 100 psi),

-40°C dew point

**Mounting Configuration:** 19-inch rack

**Dimensions (W x H x D):**

48 x 17.7 x 50.9 cm (19 x 7 x 20 in.)

**Net Weight:** 15.9 kg (35 lb)

### Approvals and Certifications

UL/CSA General Safety Requirements

Complies with all Relevant European Directives



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MOISTURE