

AMETEK 303 MOISTURE MONITOR

HIGHLY ACCURATE MEASUREMENT OF TRACE MOISTURE IN GAS STREAMS AT MODERATE COST

Moisture in gas streams has a way of causing trouble in manufacturing operations and in many research and quality control procedures. This situation frequently arises since moisture affects the chemical, electrical, and physical properties of virtually everything. Undetected or unchecked moisture can adversely affect product quality and/or slow production to a standstill.

This trouble can stem from using inadequate moisture monitoring and control instrumentation. That's where AMETEK's 303 Moisture Monitor comes in.

Description

The 303 Moisture Monitor, the original electrolytic moisture monitor, offers a practical solution to the problem of measuring the moisture content of gas streams. Based on Faraday's Law, the

AMETEK 303 absorbs and electrolyzes moisture present in the sample gas. As a result, the instrument does not require calibration. It is sensitive down to fractional parts per million and is linear up to its maximum reading of 1000 parts per million by volume. Accuracy is 5 percent of full scale on any range. Since the electrolytic cell used to measure moisture is virtually specific to water, the instrument can be used to monitor nearly all gases.

The 303 Moisture Monitor is equipped with a highly accurate, adjustable flow-control system, a large moisture indicating meter, all solid-state electronics, and a rugged plug-in electrolytic cell which can be replaced in seconds without tools. It is light in weight and is suitable for both portable use and permanent installation.

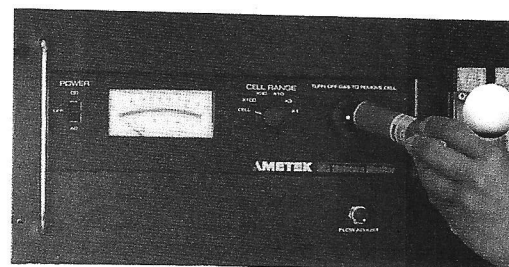
Remote Locations and Other Features

Terminals are provided for transmitting instrument output to a remotely located recorder or control center. Output span

is adjustable from 0 to 100 mV by means of a screwdriver adjustment on the back panel.

Portable operation is achieved merely by flipping a switch on the front panel from ac to battery power. A clip and contacts inside the case hold a standard "B" battery.

The built-in bypass piping system, which separates sample flow from bypass flow at the cell entrance, increases sample flow and improves system response time. This bypass feature is also valuable when the 303 is in portable service analyzing discrete samples. In these applications, the bypass piping system assists in purging gas cylinders, valves, pressure regulators and tubing prior to monitoring moisture.



Applications

The 303, a general purpose instrument, is designed to measure moisture content in gases such as air, nitrogen, argon, and others with comparable characteristics.

The following list indicates some of the applications in which the 303 plays a significant role.

- Monitoring air humidity in dry boxes.
- Continuous monitoring of atmospheres in simulated space chambers.
- Sensing elements in humidity control systems.
- Monitoring inert protective atmospheres in brazing or sintering furnaces.
- Control of dew point in annealing furnaces.
- Monitoring moisture in many fluorocarbon gases.
- Constant measurement of batch and continuous driers to assure quality control without the expense of overdrying.
- Monitoring anhydrous batch chemical processes at startup.
- Quality control of transistor and diode backfill gas.
- Instrument air systems.
- Cryogenic processes.
- Radar waveguides.

ACCESSORIES

A. Sample and Bypass Flowmeter

Catalog No. A. 303138901

Consists of a pair of glass tube flowmeters on a common bracket ready to mount on back of the 303 or on front of the model rack mount version. Range: 0 to 250 mL/min of air for sample flow and 0 to 900 mL/min of air for bypass. Permits monitoring of proper sample flow rate through the 303. In addition, combined with the built-in bypass tubing, the option allows monitoring of higher flows through sample delivery system to minimize total response time.

B. Adjustable Alarm

Catalog No. 303046000

Solid state device with graduated set dial, manual reset button, power indicator, internal buzzer, and latching relay

contacts for control use. Self-contained in painted sheet metal housing for bench top use. Input: 0 to 10 mV dc.

Output: SPDT relay contacts, rated 3 A resistive or 1 A inductive at 115 Vac, or 26.5 V dc. Power required: 105 to 125 V, 50/60 Hz, 10 watts. Dimensions: 102 mm (4 inches) high x 178 mm (7 inches) wide x 127 mm (5 inches) deep. Weight: 1.0 kg (2.2 pounds). Electrical classification: General Purpose.

C. Oil Separator

Catalog No. A. 303165901

For use at inlet when sample is likely to contain entrained oil mists.

D. Filter, In-Line

Catalog No. A. 203641000

Sintered stainless steel 2- μ m element, brass body, 3.2 mm (1/8 inch) OD tube connections.

E. Bubble-O-Meter

Catalog No. A. 303030006

Laboratory device for precision measurement of sample flow rate.

F. Battery

Catalog No. A. 203625000

"B" type battery, 67.5 V

G. Low Pressure Accessory

Catalog No. A. 203269001

Stainless steel bellows pump for use with analyzer when sample pressure is less than the required minimum of 70 kPa (10 psi) gauge. Power required: nominal 115 V, 60 Hz, 160 watts (220 V, 50 or 60 Hz option available). Inlet and outlet port size 1/8 inch NPT. Weight: 2.5 kg (5.5 lb).

H. Pressure Reducing Assembly

Catalog No. A. 510150901

Used for sampling sources from gauge pressures of 700 kPa (100 psi) gauge to 20,700 kPa (3000 psi) gauge. Made of stainless steel. The assembly is supplied ready to install, complete with pressure reducer, gauge and relief valve.

PERFORMANCE SPECIFICATIONS

Catalog Number: A. 303100000

Dynamic Range: 0 to 1000 parts per million by volume and 0 to 50 lb/million ft³ at 16°C (60°F), 101.4 kPa (14.7 psi) absolute.

Accuracy: 5 percent of full scale on any range

Response Time: A 63 percent response to a stepwise change in either direction between 50 parts per million and 1000

parts per million will occur in 30 seconds or less.

Sensitivity: 0.5 part per million.

Power Input: Choice of 100, 120, or 230 V, 50 or 60 Hz, 10 watts. Normal line transients will not affect operation. May be dc powered with internal 67.5-volt battery (not supplied).

Output Voltage to Recorder: 0 to 100 mV dc full scale, adjustable.

Use Classification: For laboratory or general purpose areas only. This unit is not designed for use in locations which are hazardous because of the presence of combustible dust or flammable gases or vapors.

Sample Temperatures: Up to 52°C (125°F) at instrument inlet.

Sample Pressure: 70 to 700 kPa (10 to 100 psi) gauge. Samples below 70 kPa (10 psi) gauge, including subatmospheric, may be monitored by using a low pressure accessory, Catalog No. A. 203269001, to pump sample through the instrument. Sample pressures from 700 kPa (100 psi) gauge to 20,700 kPa (3000 psi) gauge may be monitored by using a pressure reducing assembly, Catalog No. A. 510150901.

Sample Flow: 100 mL/min at atmospheric pressure, 16°C (60°F) adjustable, controlled to ± 2 percent.

Limitations: Most gases or vapors may be analyzed for moisture with the 303. However, some compounds are known to reduce instrument performance.

Hydrogen and oxygen in sample: Can recombine to form moisture, causing instrument to read high. Effect can easily be determined and corrected by a simple procedure outline in operating manual.

Unsaturated hydrocarbons (exclusive of aromatics): Tend to polymerize in detector cell, shortening cell life.

Light alcohols: Water splits off molecule causing instrument to read high.

Amines and Ammonia: React with P₂O₅ coating in electrolytic cell. Use not recommended.

Fluorine and hydrogen fluoride: React with materials of construction. Use not recommended.

MECHANICAL SPECIFICATIONS:

Electrolytic cell: A self-contained cartridge that can be replaced in seconds. Electrical and sample connections are made automatically when the cartridge is inserted.

Controls: Attenuator with x1, x3, x10, x30, x100 settings. Power switch for OFF, AC or DC battery settings. Screw-driver-adjustment control permits use with potentiometric recorders with full-scale sensitivity of 100 mV dc or less.

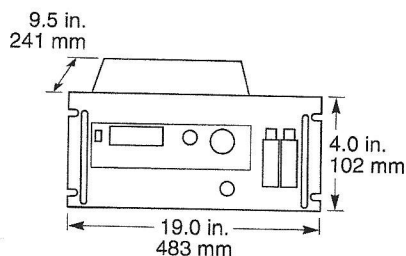
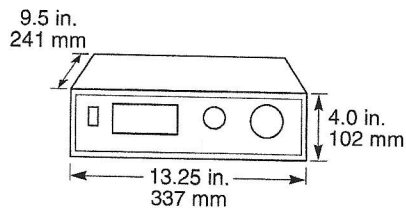
Indicators: Large, easy-to-read panel meter independently calibrated in parts per million by volume and lb/million cu ft. Mirror-backed for improved reading accuracy.

Connectors: Sample IN, Bypass OUT, and Sample OUT fittings for 1/8-inch OD tubing. Terminals for recorder connection.

Materials of Construction: Sample comes in contact with P_2O_5 , stainless steel, Teflon® fluorocarbon resin, glass, platinum, and Viton.

Weight: 6.8 kg (15 pounds).

Cabinet Dimensions:



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