

## Model 304 Moisture in Chlorine Analyzer (MCA)

Chlorine manufacturers know the importance of measuring moisture in chlorine. Chlorine is formed by the electrolysis of brine, therefore chlorine is wet when produced and must be dried before compression and liquefaction. When dried chlorine comes in contact with water, hydrochloric acid is formed, causing corrosion to proceed rapidly in compressors and plant piping, which must be protected. The AMETEK Model 304 Moisture in Chlorine Analyzer (MCA) offers a solution to the problem of making an accurate, repeatable and reliable measurement of moisture in dried chlorine gas.



One of a family of AMETEK Moisture Analyzers

### SUPERIOR BENEFITS

#### Two Polyester 4X Enclosures

The Model 304MCA consists of two polyester NEMA 4X enclosures. One enclosure houses the sample system and sensor, and the other contains the electronic controller/display. This separation protects the electronics, preventing damage should a leak occur in the sample system. Being mounted in a NEMA 4X enclosure permits the sample system to be installed close to the sample tap for fast and accurate measurement.

#### Materials of Construction

The Model 304MCA's sample-wetted materials are P<sub>2</sub>O<sub>5</sub>, Monel, Teflon, fluorocarbon resin, Kynar, glass, platinum, and Viton, making the analyzer resistant to attack by chlorine. The result is high reliability and minimal maintenance.

#### True Process Analyzer Features

The 304MCA is the moisture analyzer of choice for accurately measuring moisture in chlorine. A 4-20mA output compatible with a 625-ohm maximum load, transmits the moisture level to a recorder or control center. A built-in bypass flowmeter

increases total sample flow to keep response time to a minimum. The 304MCA is equipped with a digital moisture indicating meter, all solid state electronics, a rugged plug-in moisture cell, particulate filter, easily replaceable pressure regulator and Cl<sub>2</sub> calibrated flowmeter.

#### Electrolytic Cell

The electrolytic cell is in a self-contained cartridge that can be replaced in seconds. It does not require calibration, and is virtually specific to water. Sample connections are made automatically when the cell is inserted. Electrical connections are made through wires and a two-pin plug.

#### After-Sale Support

Our **AMETEK Service Assistance Program** is available to all AMETEK analyzer customers. ASAP is a comprehensive package of after-sale support programs, from hands-on training, to 24-hour phone help, to warranty extension. Contact AMETEK for additional details. (ASAP programs may have limited availability in some world areas.)

# PERFORMANCE SPECIFICATIONS

**Dynamic Range:** 0 to 1000 ppmv (0 to 2000 ppmv range possible with reduced sample flow)

**Sensitivity:** 1.0 ppmv

**Accuracy<sup>1</sup>:** 2 ppm or ±20% of the display reading, whichever is greater

**Sample Pressure and Flow Requirements<sup>2</sup>:** Pressure: Vacuum to Max 400 psig (2758 kPa); Flow Rate: 100 mL/min plus bypass

**Utility Requirements:** 100 to 130 VAC or 200 to 260 VAC (specify required power when ordering), 10 W maximum

**Analog Output:** 4-20 mA DC proportional to range selected, compatible with 625-ohm maximum load

**Alarms:** Rated for 1 A, 24V DC, normally open and normally closed contacts; user-settable to fail-safe or low-power operation

**Ambient Temperatures<sup>2</sup>:** 32° to 104°F (0° to 40°C)

**External Connectors:** Gas IN and OUT fittings for 1/8-inch OD tubing. Internal connections for analog output and alarms; relay jumper changes operation to fail-safe mode

**Front Panel Controls:** Analog Ranges 0 to 10, 100, 1000 and 2000 ppmv

- Display light
- Alarm
- Standby power
- Electrical test
- Cell test
- Power

**Cabinet Weights:** Sample 20 lb. (9.1 kg), Electronics 15 lb. (5.6 kg) (each)

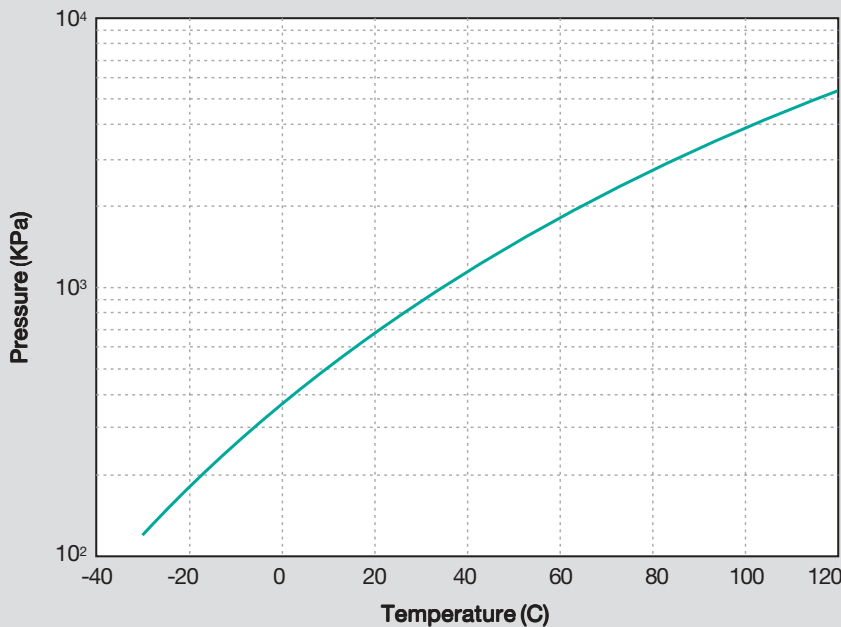
**Cabinet Dimensions (W x H x D):** 24 x 12.5 x 6.25 in. (61 x 31.8 x 15.9 cm)

### Approvals and Certifications

- UL/CSA General Safety Requirements
- UL/CSA Class I, Division 2, Groups A, B, C, D T4A
- Complies with all relevant European directives

1. Consists of flowmeter accuracy plus analytical accuracy.

## VAPOR PRESSURE OF CHLORINE



<sup>2</sup>The AMETEK Model 304MCA is a gas-phase analyzer. It is the customer's responsibility to ensure that liquid chlorine is not introduced into the 304MCA. The chart shows the vapor pressure curve of chlorine.

Equation: Vapor Pressure in pascals (Pa), T in kelvins

$$= \exp(71.359 - 3855.6/T - 8.5216 \ln T + 0.012386T)$$

### Source

Calculated from Equation In:

Daubert, T.E., and Danner, R. P., Physical and Thermodynamic Properties of Pure Chemicals, Hemisphere Publishing Corporation, Washington, Philadelphia, London, 1992

One of a family of innovative process analyzer solutions from AMETEK Process Instruments. Specifications subject to change without notice.



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