

Series 200 Aromatic Hydrocarbon Analyzer



Series 200 AHC Analyzer

The identification and quantitation of organic impurities is of vital importance to many world industrial processes in order to ensure the health and safety of workers and the general population. Benzene, as a trace impurity, is of critical importance with respect to environmental monitoring, but even more so to the beverage industry, because benzene is a known carcinogen.

Carbon dioxide (CO₂) is a major ingredient in the soft drinks enjoyed throughout the world. Benzene contamination of raw CO₂ is of tremendous concern to the beverage bottlers because of the obvious health considerations, as well as the enormous expense and unfavorable public relations fallout of a publicized product recall. The industry is in need of a definitive method of benzene speciation and quantitation; one that is reliable, yet fast and easy to use.

The GOW-MAC® Series 200 Aromatic Hydrocarbon Analyzer meets all ISBT Method 12 criteria for selective measurement of benzene in CO₂. A newly designed photoionization detector (PID) and proprietary technology are used for the specific measurement of benzene without interference from other potential impurities in beverage-grade CO₂. The detector exhibits linearity over three orders of magnitude, with detection limits for benzene of < 5 ppb, far below the ISBT specification of 20 ppb.

The Series 200 AHC is specifically designed as a rugged, low cost, low maintenance, simple-to-use, turn-key system. Calibration and sample introduction are totally automated. The Series 200 AHC system is also capable of PC-based control and data logging.

Highly selective for benzene in CO₂

Rugged, simple to use, low maintenance

Batch or continuous stream monitoring

Automatic, hands-free calibration, flow setting and analysis

Rack mount or bench-top

The Series 200AHC is designed for hands-free application via the use of a computerized user interface. A 2-line LCD display and non-tactile keypad allows for fast, easy, and constant monitoring and reporting of benzene data.



The back panel is comprised of inlet ports for transport, calibration and sample gases, detector vent, and terminal strips for software function connections and output signals.

Speciation System

There are many potential impurities in processed CO₂ at the ppb level that can potentially interfere with the absolute identification of benzene. The speciation system employed by the Series 200AHC has been tested against virtually all of the potential alcohol, oxygenate, and aromatic impurities that could be present, with ionization potentials below 10.2 eV, and determined to be interference-free.

Benzene is captured by the software system, with results displayed digitally on the instrument's front panel. The impurity is speciated, captured, compared against a previous (automatic) standard run, and the value is read from the instrument panel. Benzene is speciated and captured in < 3 minutes, interference free.

SB-200AHC



International Headquarters
GOW-MAC Instrument Co. • 277 Brodhead Road • Bethlehem, PA 18017 • U.S.A.
Tel: (610) 954-9000 • Fax: (610) 954-0599 • E-mail: sales@gow-mac.com • URL: www.gow-mac.com

European Office
GOW-MAC Instrument Co., Ltd. • Bay K 14a, Industrial Estate • Shannon, Cty. Clare • Ireland
Tel: +353-61-471632 • Fax: +353-61-471042 • E-mail: sales@gow-mac.ie

The speciation is maintained at a factory set, constant temperature to ensure optimized performance and capture of the benzene by the data system. The software system has a bake-out function, which can be performed as a form of preventive maintenance.

Gas Flow System

The flow system combines transport, calibration and sample gas movement with discreet sample introduction and speciation capability.

The transport gas is internally regulated and factory set negating the need for operator intervention. The gas may be supplied by cylinder, bulk vessel or portable hydrogen generator.

The calibration and sample gases are externally regulated by the user. As an option to the Series 200AHC, GOW-MAC will design the calibration/sample flow control accessory to meet the needs of the specific environment of the customer. Gas flows may be monitored by the flow meters on the front panel of the instrument.

The automatic injection system is comprised of two electrically actuated valves. The first valve is for stream selection of the calibration or sample gas. The second is a gas-sampling valve for discreet, constant-volume sample presentation. A solenoid valve, upstream from the sample loop, is included so that valuable calibration gas is not wasted during analysis cycles or idle time.

Software System

The on-board software package contained in the Series 200AHC allows complete unattended operation of the analyzer with a few simple input commands to the keypad on the instrument's front panel. The user is left only to ensure that the appropriate gases are flowing to the instrument.

Functions

Calibration: automatically initiates proper stream selection and span gas-cal gas purge prior to sample introduction. The calibration captures and stores the detector output in the form of a mA current, which is proportional to the benzene signal. The data is stored, and the calibration is immediately validated by a second inject. The validation run is compared to the stored calibration run. The calibration is validated when agreement is reached between the runs. The recommended calibration gas is 100 ppb benzene in N₂. The concentration value of calibration standard may be entered via the keypad.

Run: automatically selects the correct sample stream, and can be configured for use with an external trigger or continuous analysis. The benzene concentration, in ppb, is displayed on the front panel and updated upon the completion of each analysis.

Bake-out: upon the user's command, the software system will initiate a timed bake-out sequence of the speciation system. The speciation oven will automatically elevate to a factory-set temperature for a specific period of time and automatically cool to resume operation.

All functions, including status notes, are clearly displayed on the front of the instrument so that the progress of each calibration, validation and/or analysis can be monitored.

Maintenance & Training

The Series 200AHC 200 is designed for modular maintenance in the field. All maintenance activities are "plug and play", and include detector assembly and speciation assembly replacement. Each activity requires no tools, and is accomplished in ten minutes or less.

No specialized training is required for operation of the GOW-MAC Series 200AHC. It has been designed around the concepts of simplicity and human factors, and is intended to provide years of service with little operator intervention.

Applications

The Series 200AHC has been developed for both the CO₂ producer and the beverage bottler. It can accept samples from a variety of sources (cylinders, bulk tanks, trucks, rail cars) and perform continuous, unattended sampling and analysis.

Instrument Specifications

Gas Connections	1/8" Swagelok®
Mounting	EIA Standard 19" rack, 7U height or bench top
Transport Gas Flow Rate	≅ 30 ccpm
Transport Gas Pressure Required*	60 psig
Instrument Operating Temp.	Ambient
Detector Temperature	Factory set; adjustable
Oven Temp Regulation	Factory set w/ software controlled conditioning
Power Required	400 VA
Sample Flow Rate Pressure Required*	5 psig (20 psig max)
Calibration Gas Pressure Required*	5 psig (20 psig max)
Sensitivity	< 5 ppb benzene
Linear Range	< 5 ppb to 120 ppb (1 x 10 ³)
User Interface	Keypad: Numerical, non-tactile Display: 16 character x 2-line LCD 5 x 7 characters w/ cursor LED backlight 99.0 x 24.0 mm viewing area
Dimensions	16.9" W x 12.25" H x 23" D (42.9 x 31.1 x 58.4 cm)
Weight	Net: 50 lbs. (23 kg) Shipping: 60 lbs. (28 kg)

* Sample, transport, and calibration gas inlet pressures up to 3000 psi with optional pressure regulators.

** Specifications and features will vary depending upon system configuration and are subject to change without notice. The above specifications are established during design, but are not to be construed as test criteria for every product.

Ordering Information

Series 200AHC, 115 V, 50 Hz
Series 202AHC, 230 V, 60 Hz

Warranty

The Series 200AHC manufactured by GOW-MAC® is warranted for a period of 6 months against defects in materials and workmanship.