



Beaver Creek Analytical, LLC

Underwater Mass Spectrometer – Dissolved Gas Analyzer

Pre-release Brochure, Sept. 2023

DESCRIPTION

Capable of subsea dissolved gas measurements at depths up to 3000 m, our

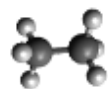
underwater mass spectrometer is a product of 20 years' experience. The mass spectrometer has a membrane inlet capable of admitting and analyzing dissolved gases with atomic weights up to 100 amu. With a real T90 response time as good as 20 s for methane and other permanent gases, this analyzer is capable of **high-resolution mapping and timely analysis for real-time reporting.**

Specifications

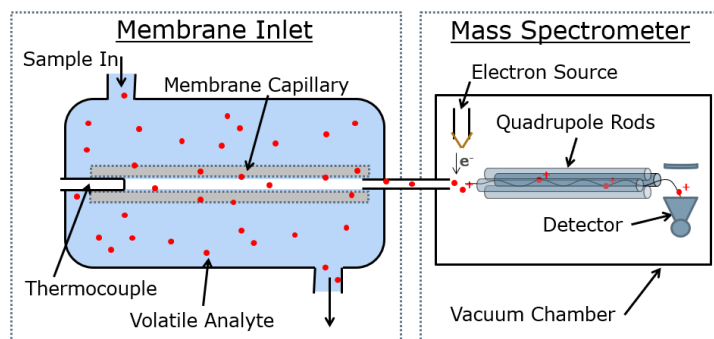
Depth Rating	<ul style="list-style-type: none">3000 m (custom housings available)
Mass Range	<ul style="list-style-type: none">1 to 100 amu
Power	<ul style="list-style-type: none">80 W nominal, 180 W maxPrimary input: 110-250 VACSecondary input: 18 to 60 VDC
Diameter	<ul style="list-style-type: none">202 mm [8 inches]
Length	<ul style="list-style-type: none">526 mm [20.7 inches]
Approx. Weight	<ul style="list-style-type: none">34.3 kg in Air16.9 kg in MSW
Comm.	<ul style="list-style-type: none">R2-232, 57600 baud, 8N1
Software	<ul style="list-style-type: none">Underway Analysis Interface<ul style="list-style-type: none">Inputs for 10 additional serial devicesTimeseries, Depth Profiles, Datalogging, mappingAPI command-set available



PRINCIPLES

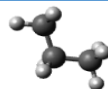


The system's membrane inlet allows continuous introduction of multiple species with no sample preparation. As sample is passed along the surface of the membrane, gases diffuse into the vacuum chamber for analysis. Gas diffusion through the membrane is proportional to concentration, enabling quantitative analysis. Mass spectrometry allows sensitive detection of multiple chemical species with high specificity across **six decades of dynamic range.**



In situ calibration can increase system accuracy and produce high confidence absolute and ratiometric results. **Externally seawater standards containing known amounts of dissolved gas are available** and can be introduced in situ using an optional stream selector.

EXAMPLE ANALYTES



Detection Limits: Analyte and setpoint dependent; typically, 20 nmol/kg.

Response Times: 30 s for dissolved permanent gases with membrane kept at RTP. Longer for cooler, high-pressure conditions or larger analytes.

Dissolved Gases: Nitrogen, Oxygen, Argon, Carbon Dioxide, Hydrogen Sulfide

Volatile Organic Compounds: Methane, Ethane, Propane, Butane, Pentane, Cyclopentane, Benzene, Toluene

