



## ARI Mod-GC for TOF-MS

*The ARI Modular GC (Mod-GC) system is lightweight, compact and customizable. The instrument is designed to seamlessly integrate with ARI EI-, Vocus PTR- and CI-ToF-MS detectors. The complete instrument is 55 x 55 x 30 cm and weighs less than 24 kg.*

Aerodyne works with our customers to provide a GC system with a separation method appropriate for their analytical needs. The instrument delivers with the required capillary column installed and analytical methods pre-loaded into the Windows-based control software, for a true *turn-key* operation.



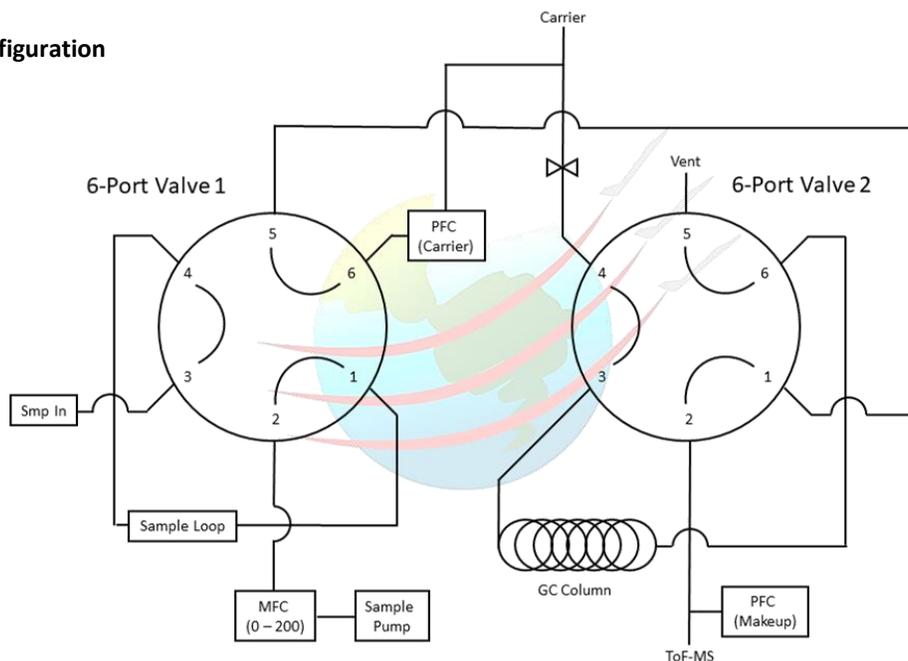
Figure 1. ARI Mod-GC photo

### Features

- Mates directly with ARI EI-, Vocus PTR-, and CI-ToF-MS systems
- Compatible with other commercial detectors
  - e.g. Agilent Q-MS, FID
- Compatible with commercial pre-concentration systems
  - The ARI cryogenic pre-concentrator is currently under development (to market in Fall 2020)
- Modular column oven design allows column replacement in minutes without venting MS detector
- Uses standard fused silica or metal capillary column
- Capable of operating two GC ovens simultaneously
  - e.g. GC x GC
- Standard column backflush flow path
  - Reduces column bake-out times
  - Prolongs column lifetimes by reducing exposure to high bake-out temperatures
- Heated sample path, user controlled up to 175°C
- Electropolished nickel chromatography valves to suit user-specified sample path
- Instrument control via Windows graphical interface with limitless ramping, dynamic PID control
- Data analysis via TERN, automated chromatographic peak fitting software, in Wavemetrics Igor Pro

Performance Specifications	
Max Heating Rate:	130 °C/min
Max Cooling Rate:	190 °C/min
Max Column Temp:	260 °C
Accuracy:	0.25 °C (isothermal), 0.5 °C (ramped)
Power:	500 W (maximum), 250W (typical)
Physical Specifications	
Size (including rack)	55 x 55 x 30 cm (H x W x D)
Weight	24 kg (52 lbs)
Electrical Power	500W (3.5A @ 120 VAC/60Hz) 120 VAC/60Hz or 230VAC/50 Hz
Column Compatibility	All fused silica and metal columns Max length 60m @ ≤0.32mm ID Max length 30m @ ≥0.53mm ID
Required Accessories	
Windows PC equipped with high-speed USB	
UHP grade or equivalent carrier gas (e.g. helium), makeup gas (e.g. zero air)	
Gas purifier(s) (e.g. VICI P100)	
Gas regulators, external tubing	

## Standard Configuration



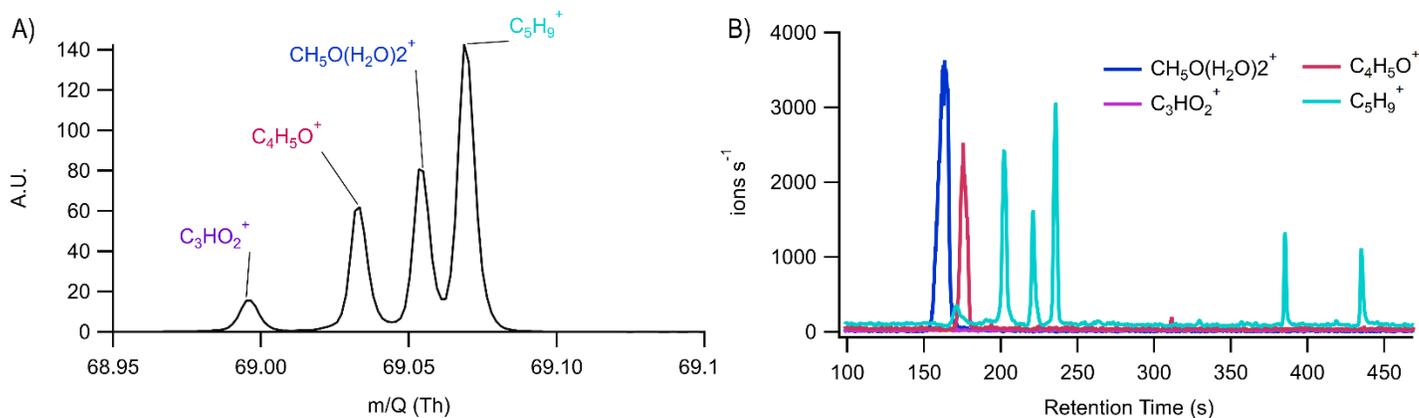
**Figure 2.** ARI Mod-GC Flow Path

The standard ARI Mod-GC is delivered with two 2-position chromatography valves to direct analyte throughout the GC flowpath (Figure 2). The ARI Mod-GC uses a sample-loop injection. For enhanced sensitivity required in ambient atmospheric settings, Aerodyne Research Inc. can provide optional adsorbent-based or cryogenic preconcentration solutions, depending upon customer requirements.

For more customized analyses, the ARI Mod-GC can be equipped with up to four chromatography valves to support various applications (e.g. the use of a pre-concentrator, multiple GC columns, multiple detectors).

## Exemplary results

- ARI recently deployed the Mod-GC-Vocus in collaboration with the de Gouw research group (University of Colorado at Boulder) to study indoor air quality.
- High-resolution fits of the Vocus data allow for identification of multiple ions within a single unit mass response (Figure 3a).
- With GC separation before the Vocus detector, we can attribute the ion response to a single species, or to multiple compounds (Figure 3b).



**Figure 3.** (A) Vocus mass spectrum at  $m/Q$  69. The high-resolution MS shows four separate peaks. (B) Chromatographic retention time clearly separates the compounds.