Q ACSM and ToF ACSM Systems

QACS

15-30 min data typical

TOF ACSM

5 min data typical, ~5x sensitivity
67 Instruments Around the World
Automated Valve System for Instrument Zero

Aerosol mass is determined from difference of ‘Sample – Filter’
Pfeiffer Pumps
156 Total shipped since Feb. 2011, 7 failures, 6 P2, 1 P3
*blue are all same instrument*

<table>
<thead>
<tr>
<th>Pump#</th>
<th>S/N</th>
<th>Ship Date</th>
<th>Fail Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1495 7147</td>
<td>July, 2011</td>
<td>August, 2012</td>
</tr>
<tr>
<td>2</td>
<td>1510 4557</td>
<td>November, 2011</td>
<td>August, 2012</td>
</tr>
<tr>
<td>3</td>
<td>1512 8096</td>
<td>March, 2012</td>
<td>October, 2013</td>
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<tr>
<td>2</td>
<td>1470 2464</td>
<td>October, 2012</td>
<td>November, 2013</td>
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<tr>
<td>2</td>
<td>1492 3456</td>
<td>June, 2011</td>
<td>June, 2014</td>
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<tr>
<td>2</td>
<td>1495 7147</td>
<td>November, 2013</td>
<td>April, 2014</td>
</tr>
<tr>
<td>2</td>
<td>1530 7200</td>
<td>May, 2012</td>
<td>July, 2014</td>
</tr>
</tbody>
</table>
Different Inlet and Filter Switching Valve Types

Older versions

Current versions
Software Configuration for Valve Types

Select ‘Digital line configuration’

Prior to 140-110: Both Inlet & Filter ‘Gear Drive’

140-110 → 140-142: Filter = Direct Drive Inlet = Gear Drive

140-142 → Now: Both Inlet & Filter Direct Drive
Programmable Digital Line

Select ‘Digital line configuration’

24VDC on/off black and white wire pair from vaporizer/autovalve connector

Toggle options: start/stop, timer, scan completion, after ‘n’ file saves
'Pause'

Pause before start of scan – 125 ~ 1s
Time to flush 1/8” tube between filter valve and inlet.
Time to parse data buffer.
ACSM Igor Data Exporting

- User configurable
- Select species, diagnostics, etc.
- Select file format (.itx, .csv, .dat (tab delimited))
- 1 file/point or 1 file/day
- Pump/Dryer data merging coming soon.
Sample Line Flow Controllers

Early 2013: Switch from speed controlled blower to diaphragm pump with proportional valve for dryer compatibility.

25 delivered, 7 failed diaphragms
Average <5000 hours lifetime (~6 months) rated ‘at least 10,000’
Diaphragms not replaceable – need to swap pump

Looking into new options to replace the diaphragm pump with one with longer lifetime and user replaceable diaphragms.
Q-ACSM system now meets the following CE certification standards

Emissions
- CFR Title 47 FCC, Part 15
- CISPR 11:2009+A1:2010
- EN 55011:2009 Radiated, Group 1, Class A
- EN 55011:2009 Conducted Group 1, Class A
- EN 61000-3-3: 2008 Flicker

Immunity
- EN 61000-4-2 Electrostatic Discharge (ESD)
- EN 61000-4-3 Radiated Susceptibility (RF)
- EN 61000-4-5 Surge Susceptibility
- EN 61000-4-4 Electrical Fast Transient (EFT)
- EN 61000-4-6 Conducted Disturbances Induced by RF Fields
- EN 61000-4-11 Voltage Dips and Interference (VDI)

Low Voltage Directive
- EN 61010-1:2010 Safety