CTDEP's Experience with the Synspec GC

- CTDEP was interested in investigating alternative instruments / methodologies for PAMS sampling
- CTDEP purchased two Synspec units as possible replacements for aging Perkin-Elmer systems
- The Synspec BTeX instrument has been successfully employed by a number of agencies worldwide

Perkin-Elmer vs Synspec

Perkin-Elmer

- Single Sample Stream with two column analysis
- Sample continuously collected over 40 min/hour
- Two detectors (FID) with linear response over entire range, and components (mostly)

Synspec

- Two Sample Streams, each with single column analysis
- Sample collected at selected intervals over 40 min/hour – actual sample time is about 10 minutes out of the hour
- Three detectors – One FID for alkanes; two PID's for aromatics, alkenes . Linearized by software

Perkin-Elmer vs Synspec

Perkin-Elmer

- Single response factor for all components on each detector
- Helium carrier gas/ H2 FID fuel
- Software (data review and manipulation) available on remote PC
- Software mature – with some issues

Synspec

- Individual response factors for every component
- Nitrogen carrier gas/ H2 FID fuel
- Software (data review and manipulation) available only on GC itself - but remotely accessible
- Software evolving – with some issues

Synspec utilizes system with two separate instruments

Upper box houses the PC as well as the siloxane column & PID analysis components

Lower box houses the Al_2O_3 column & PID/FID detectors

What Works

- The hardware seems quite robust. Had an early problem with a PID lamp window crack. Otherwise, no major problems in well over a year of operation.
- The H2 / air generator (LNI) works well with the Synspec unit. We did have an initial leak problem, and our two units arrived as different hardware versions, but these issues were resolved.
- Retention time stability seems good- Al2O3 column shows some drift but this is typical.
- Response stability is less well known- see next list.
- Remote access and instrument control including initiating calibrations.
- Generates a real time TXO data file which is compatible with VOCdat although the sample time may not report correctly.

What Doesn't

- Post analysis review and reprocessing of data not yet available. Thus if instrument response or retention time(s) need updating, there is as yet no means of regenerating data. This is being developed now.

- Compatability with VOCdat needs to be improved. TXO files do import OK, files need to report correct sample time- now reports an hour early

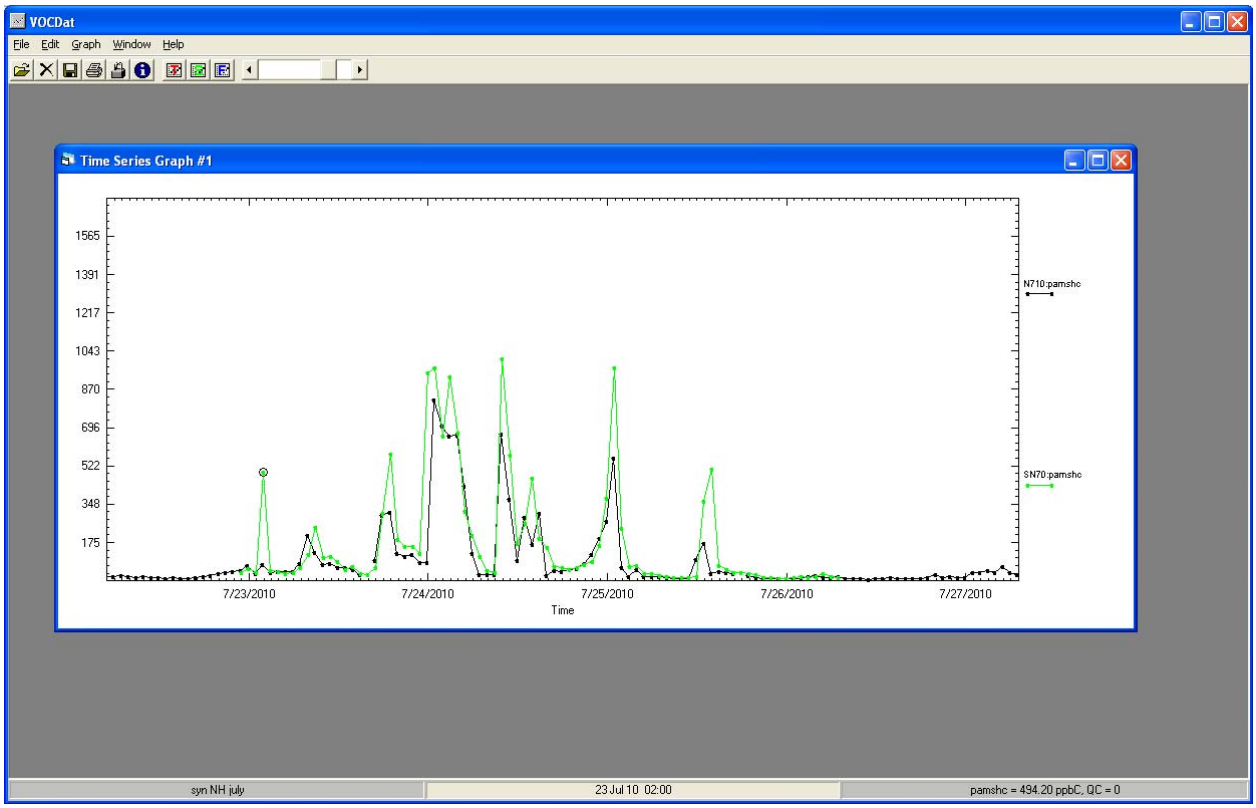
- Service personnel not available on this continent - JJ Wilbur & Associates personnel are quite familiar with Synspec and have been very responsive and helpful.

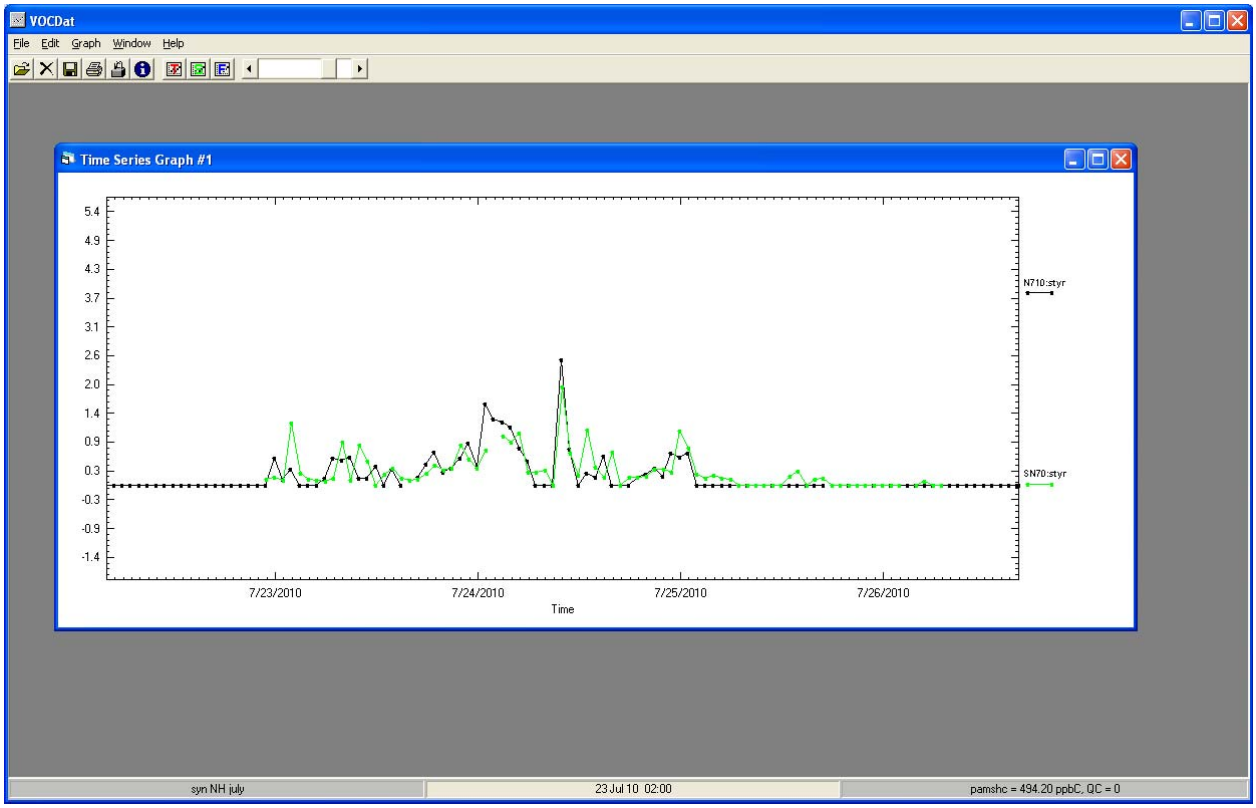
- A number of operational issues remain to be resolved-

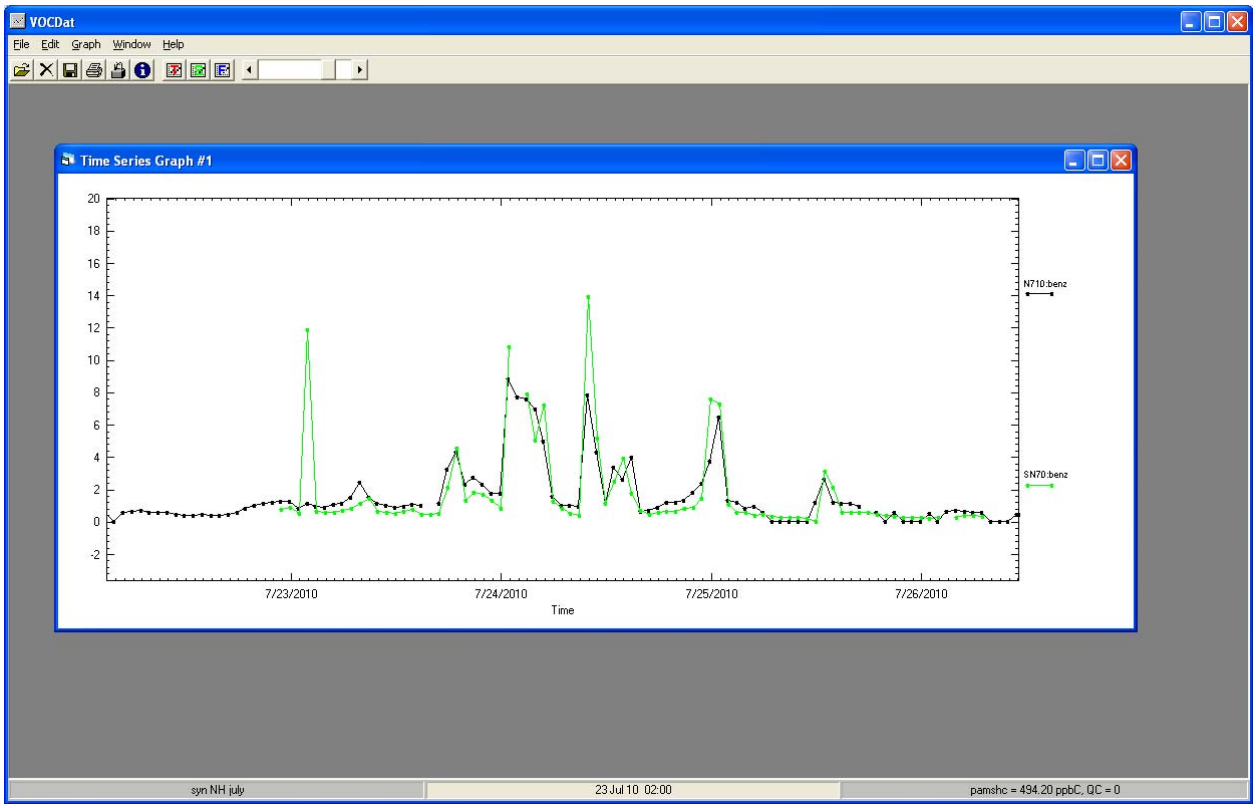
  -automated updating of GC response to calibrations

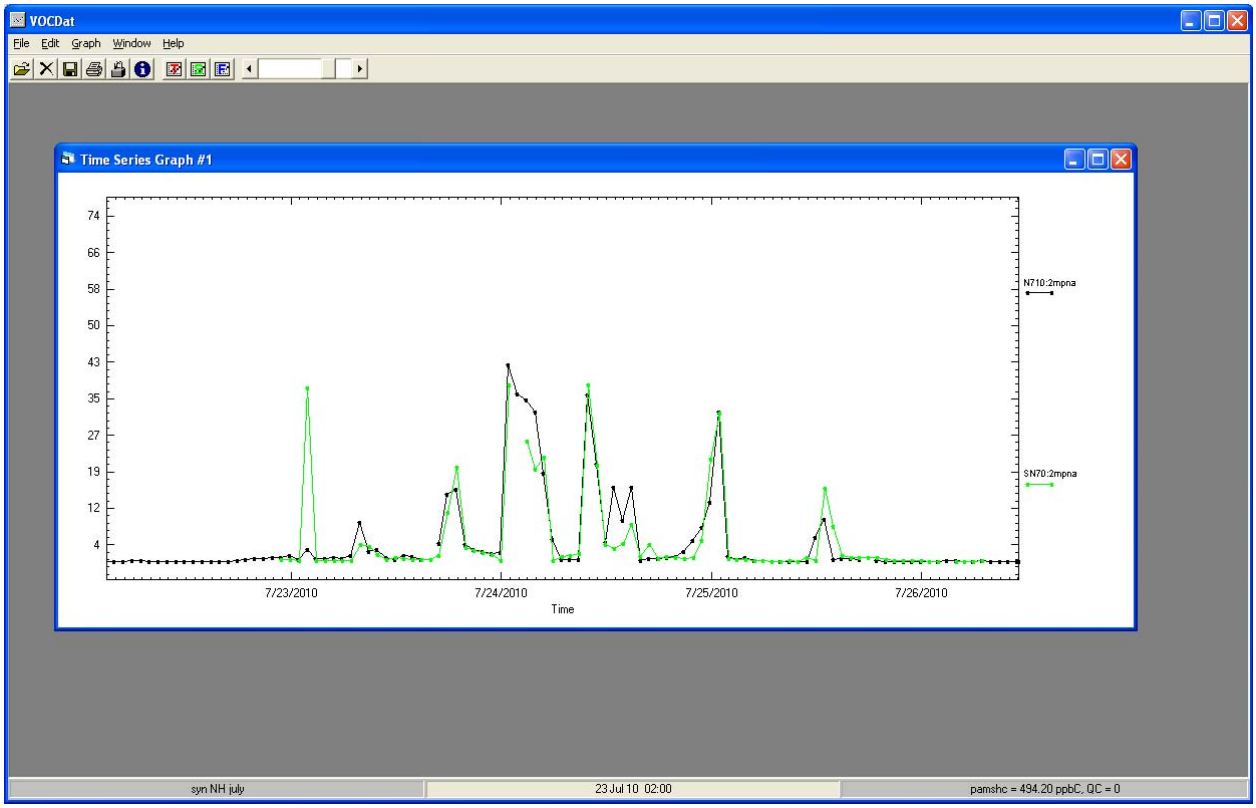
  -question of calibration with humidified vs non-humidified standards

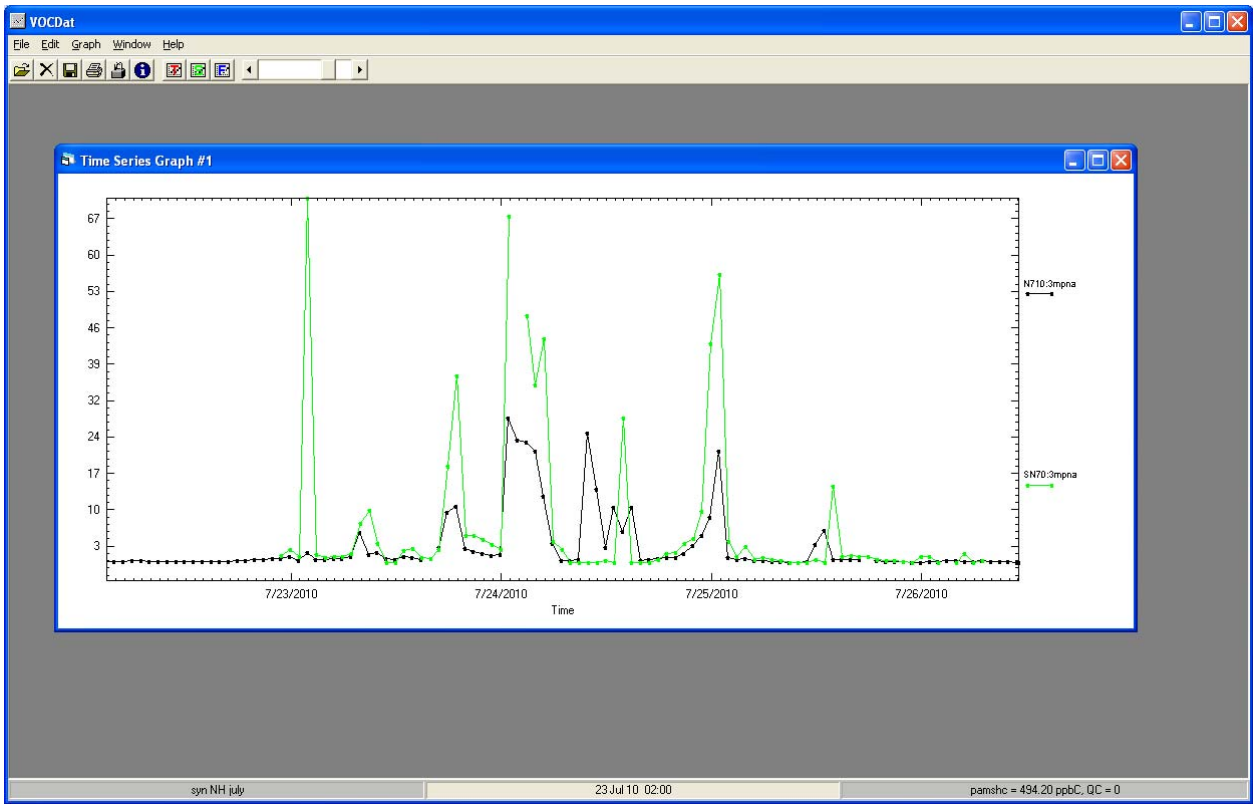
  -there is no quantification of unknowns, thus a TNMOC value cannot be obtained- there is a PAMS total only


VOCDat
File Edit Graph Window Help
Time Series Graph #1
1565
1391
1217
1043
870
696
522
348
175
7/23/2010
7/24/2010
7/25/2010
7/26/2010
7/27/2010
Time
N710:pamshc
SN70:pamshc
syn NH july
23 Jul 10 02:00
pamshc = 494.20 ppbC, QC = 0

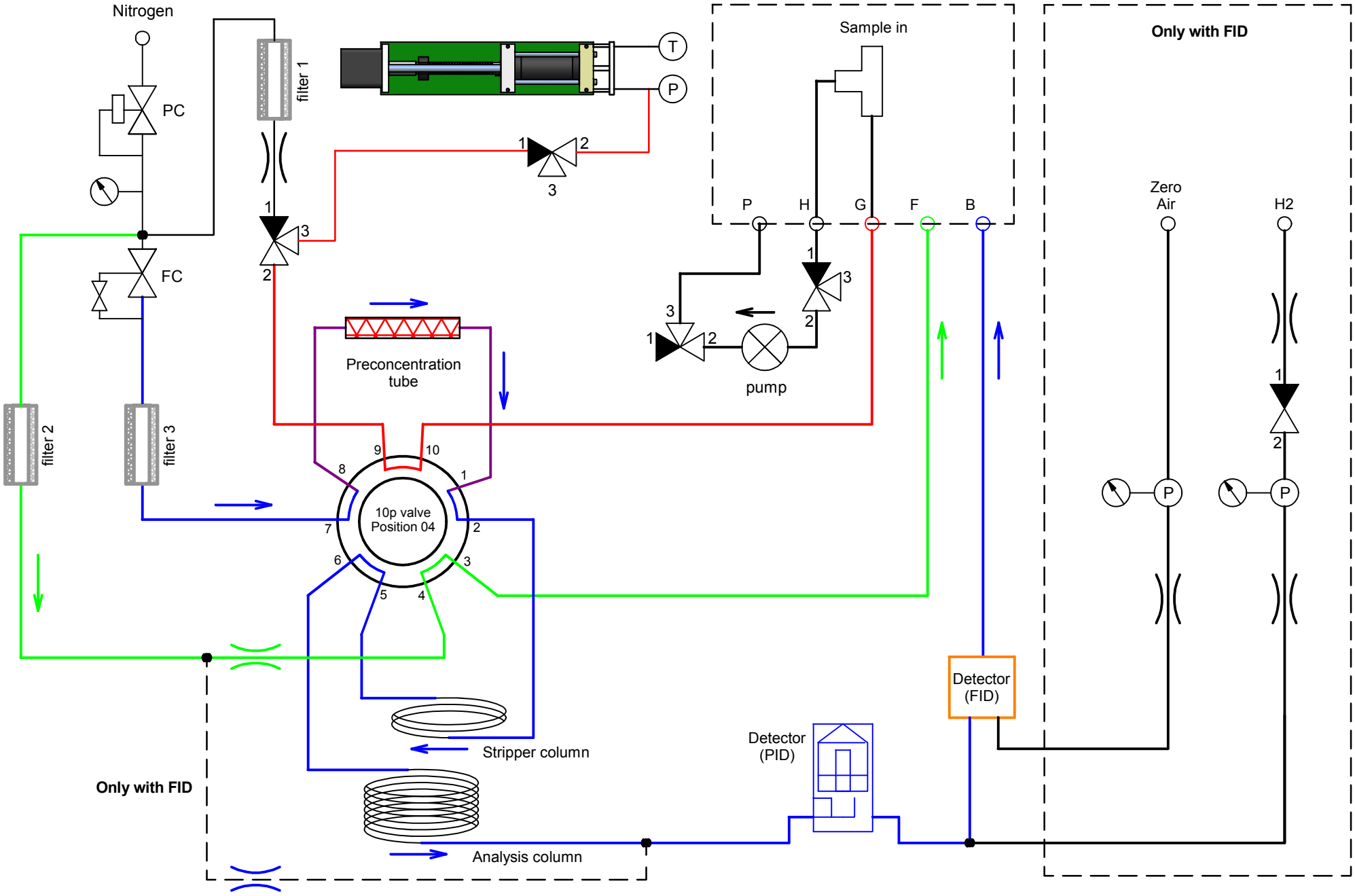
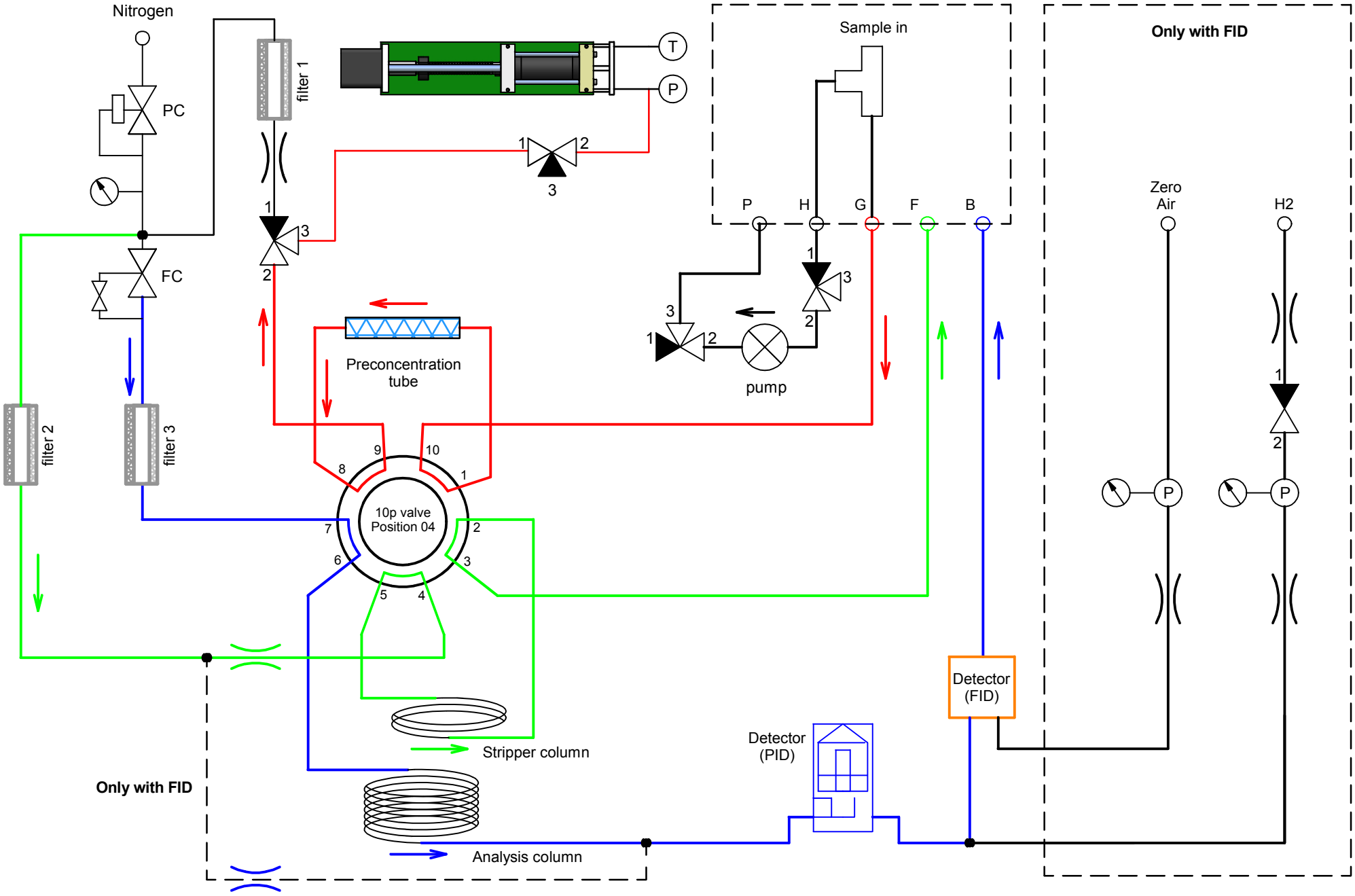

VOCDat
File Edit Graph Window Help
Time Series Graph #1
5.4
4.9
4.3
3.7
3.1
2.6
2.0
1.4
0.9
0.3
-0.3
-0.9
-1.4
7/23/2010
7/24/2010
7/25/2010
7/26/2010
Time
N710:styr
SN70:styr
syn NH july
23 Jul 10 02:00
pamshc = 494.20 ppbC, QC = 0


VOCDat
File Edit Graph Window Help
Time Series Graph #1
20
18
16
14
12
10
8
6
4
2
0
-2
7/23/2010
7/24/2010
7/25/2010
7/26/2010
Time
N710:benz
SN70:benz
syn NH july
23 Jul 10 02:00
pamshc = 494.20 ppbC, QC = 0


VOCDat
File Edit Graph Window Help
Time Series Graph #1
74
66
58
50
43
35
27
19
12
4
7/23/2010
7/24/2010
7/25/2010
7/26/2010
Time
N710:2mpna
SN70:2mpna
syn NH july
23 Jul 10 02:00
pamshc = 494.20 ppbC, QC = 0


VOCDat
File Edit Graph Window Help
Time Series Graph #1
67
60
53
46
39
32
24
17
10
3
7/23/2010
7/24/2010
7/25/2010
7/26/2010
Time
N710:3mpna
SN70:3mpna
syn NH july
23 Jul 10 02:00
pamshc = 494.20 ppbC, QC = 0

INJECT/STRIP



SAMPLING/ANALYSIS