CAPE VERDE ATMOSPHERIC OBSERVATORY (CVAO)

Ozone maintenance log

Troubleshooting
Low Flow: Capillary blockage, clean using thin wire.

December 2007 (49i): Noisy data
This could be due to condensation in the zero reference scrubber (blue can attached to the valves) although this tends to give a shift in the zero base line rather than more base line noise. Try running dry air through it for a while.
The zero scrubber could also be faulty.
It could be a problem with the valves themselves as they are usually the cause of high noise. Clean the valves, they don't usually fail suddenly but teflon can come off in tiny strips and get under the valve seats. The Teflon diaphragm inside the solenoid ruptures. Use manual, preventive maintenance section it is titled Leaks Through Solenoid and details how to check if they are working.

Returned instrument December 2008 for maintenance.

February 2009 Low flows: Pump (49C)
Both flows have dropped to around 300 ml/min. We have checked the inlet, and the capillaries which appear to be clean and unblocked and suspect it might be the pump not working as effectively as usual. The first suggestion is to inspect the Pump Diaphragm on the Pump on the 49C. Chances are, given its age, that this has gone rather than the Pump (complete). The pump is the same as the Thermo SO2 and CO analysers, but different to the NOx (42). If you take the top of the pump off, you should be able to see if the Diaphragm has perforated.
The 2 possible parts are:

8606 (49C and 49I) PUMP REPAIR KIT, KNF (FOR P/N 8550)
£76.00

8551 (49C) PUMP KNF 230V/50HZ £637.13

There is a new Pump, however, as the old style is no longer manufactured, with an alternative Part No. of 108002-00 (97.00).

June 2009: Blown fuse (49C)
Our TEI49C blew its main fuse when it was switched on recently. I assume this means an electronic fault, what tests can I do to identify the problem?

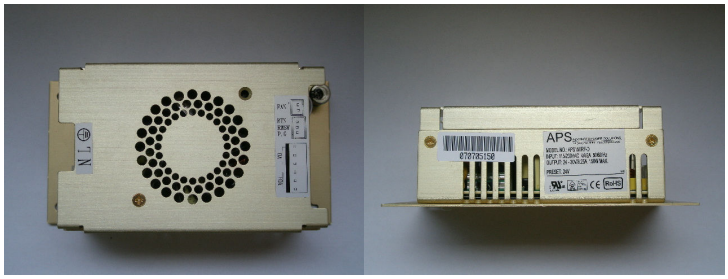
It may be due to the fuse being very close to the running current of the instrument and on switching on you get a large inrush of current as everything starts up which

weakens the fuse and it finally blows. Try putting a new fuse of the same current preferably a slow blow fuse and see if it works. If there is a problem and it goes again the first thing to try is to disconnect the pump as this will take most of the current if it still goes after that it is probably in the electronics somewhere. It is always a good idea to have a check round the wiring as a lot of fault can bee seen. The only easy way of checking to find what is at fault is to disconnect every thing and gradually reconnect all of the components until the fuse blows.

Replaced Power supply

The 24V power supply part number and price is as follows.

101681-00	Power Supply, 24vdc	£168.57



September 2009 Instrument 2 was very erratic-why??

2nd November 2009: Replaced valves (49C)

The price for a single valve for the 49C is

8573	VALVE SOLENOID 3-WAY (SPECIFY INSTRUMENT)	£678.30

N.B. TEQCOM INDUSTRIES,INC do the above cheaper!!

November 2010

A full service was carried out on Instrument 1.

June 2011

49C (Instrument 1) was returned to Air Monitors for a new detector and another service and calibration.

The price for a new detector was £835. The service cost is £300.

18th February, ozone data was logged using the serial port rather than via the a/d.

June 22, 2012

There was water condensing in the lines so for few minutes ozone 2 instrument read negative number for few minutes.

August 1, 2012

Ozone analyzer 2 switched off while inlet filter was being changed and some condensed water was removed.

August 2, 2012

Ozone analyzer 2 readings were too high yesterday afternoon after changing new filter and condensed water removal. Switched off overnight and back on this morning, readings were high at first but back to normal flow.

Aug 6,2012

Still ozone 2 is noisy and according to Luis, it is due to some water condensing in the line. The glass inlet at the ceiling is wrapped with heating cable and all tubings connected from glass inlet to the other equipments are heated as well, Just the line for both ozone equipments are not heated and this is affecting more the ozone 2 instrument. During this summer time temperature and humidity is higher in outside air. The heating tape has been sent to Cape Verde for covering ozone inlet lines on Aug 31,2012

Sep 11, 2012

Ozone 2 analyser was switched off on Sep 11, 2012 because it had water in the inlet. After cleaning the lines, it was turned on back

Oct 27-31,2012

Ozone 2 instrument is most of the time noisy. Heating tapes were also sent to station but problem did not seem to solve because of the cell intensity which dropped a lot. James cleaned the cells during his visit to CV (27-31 Oct) but still it is noisy. Ozone 4 instrument after new UPS installation has become noisy. Acc to Luis it is now temp problem rather than water condensing problems in line. He changed inlet filter before turning on ozone instruments after new UPS installation.

23rd Nov 2012
There are some issues with the zero data for ozone (2 and 4) in CV but suspect it is a calibrator issue.

9th-11th December
Calibrations performed on Instruments 2 and 4 in CV using CVTS. GAW audit performed on these instruments.

3rd-4th Dec 12
Calibration performed on Instrument 1 in York using CVTS and FGAM calibrator.

9th January 13
Zeros performed on both instruments 2 and 4 in CV.

11th January 13
Calibration on Instrument 1 using CVTS after it returned from CV.

Fixed Zero problem? Not logging enough decimal places?

29th January 13
Zeros performed on both instruments.

5th Feb 13
Calibration performed on Instrument 3 in York using CVTS.

8th February 13
Instruments 1 and 3 run together in the lab in York.

20th February 13
Scrubber changed in Ozone 2. See plot below.

21st February 13
Zeros on both instruments-see calibration log.

26th February 13
Ozone 2 rezeroed, agreement between two instruments is much better (see above plot). Intensities still decreasing at the same rate though, I have e-mailed Colin Craggs (Colin@airmonitors.co.uk) to see if he has any thoughts, suspect the lamp….