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Purpose

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To describe the procedure to be followed for performing routine maintenance of the EC9810 ozone analysers in the monitoring network.

Principle

This SOP applies to EC9810 ozone analysers. Filter and scrubber changing procedures are taken from the service manual of the analyser. Cleaning and spare part changing procedures are not described here but are to be obtained directly from the service manual.

Staff involved

This SOP is intended for the staff of the maintenance company who perform the activities described.

Equipment


- Ozone monitor (Ecotech EC9810)
- Station data processor (Ecotech)

Documentation and forms

This SOP requires the form *DLI-F-39 O3 Analyser Maintenance Report*.

The completed form is stored in electronic form in the file *DLI-F-39 O3 Analyser Maintenance Report-sn-yyyy-mm-dd.xls*, where *sn* denotes the analyser serial number, *yyyy* the year, *mm* the month and *dd* the date of the maintenance.

The paper copy of the form is stored in the history log book of the analyser.

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Procedure

General

Perform the scheduled maintenance as required by the maintenance schedule DLI-QD-103

Registration of general information and status parameters

Registration of general information:


- Enter name of customer, analyser model, analyser serial number and job number in **Customer**, **Instrument**, **ID No.** and **System/Job No.** fields respectively.
- Enter name of operator, date of test, start time and where the test was performed in **Maintenance Performed by**, **Date**, **Time Begin** (left field) and **Location** fields respectively.

Registration of reference information (section Calibration Equipment, where applicable):

- Enter flow calibrator model, calibrator serial number, pressure calibrator model and calibrator serial number in **Flow Calibrator Model**, **ID/Serial No.**, **Pressure Calibrator Model** and **ID/Serial No.** fields respectively.

Registration of analyser status parameters (section Displayed Instrument Parameters):

- On the analyser keyboard hit **<Exit>** to return to the primary screen.
- Push the **Select** button to enter the main menu. Use the **Up** and **Down** arrows on the keyboard to navigate in the main menu. Push **<Return>** to select a menu item.
- Choose **INSTRUMENT STATUS**.
- From the **INSTRUMENT STATUS** menu read the status parameters and enter them into their respective fields in the **Displayed Instrument Parameters** section of the form.
- Hit **<Exit>** to return to the primary screen.
- Hit **Select** to enter the main menu, choose **SYSTEM TEMPERATURES**.
- From the **SYSTEM TEMPERATURES** menu read the status parameters and enter them into their respective fields in the **Displayed Instrument Parameters** section of the form.
- Hit **<Exit>** to return to the primary screen.
- Hit **Select** to enter the main menu, choose **TEST MENU**.
- In the **TEST MENU** choose **OUTPUT TEST** menu.
- In the **OUTPUT TEST** menu choose **PREPROCESSOR POTS**.
- From the **PREPROCESSOR POTS** menu read the status parameters and enter them into their respective fields in the **Displayed Instrument Parameters** section of the form.
- Hit **<Exit>** to return to the primary screen.

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- From the primary screen record the measurement units in the **Instrument units** field.
- Compare the recorded values with the acceptance limits. If any values are outside the limits the cause must be investigated.

Leak test

The leak test procedure is taken from the 9810A&B Series Ozone Analyzer Service Manual. This leak check procedure requires that the vacuum capacity of the pump be known and converted to an equivalent atmospheric pressure. This can be obtained by connecting a vacuum gauge through a tee to the pump inlet.

Leak test:

- Disconnect the Sample inlet and zero air from the Auxiliary inlet. Leave the Exhaust port connected to the pump.
- Turn off the pump and allow to settle for 2 minutes. Select the **INSTRUMENT STATUS** menu and read the **GAS PRESSURE** reading as the current ambient pressure. Enter its value in the **Leak test – Ambient pressure** field.
- Plug the Sample inlet port.
- Turn on the pump and allow it to operate for 5 minutes to evacuate the pneumatics.
- Observe the vacuum gauge on the pump and enter the pressure reading in **Pump Vacuum Capacity** field.
- Select the **INSTRUMENT STATUS** menu and monitor the **GAS FLOW** and **GAS PRESSURE** readings. Enter the observed readings in the **GAS FLOW** and **GAS PRESSURE** fields respectively. The **GAS FLOW** should indicate 0.00 slpm and the **GAS PRESSURE** should be equal the vacuum capacity of the pump within ± 15 Torr (2 kPa).
- Unplug the Sample and Auxiliary inlets and reconnect the sample line.

Replacing filters and scrubbers


References are made to the **Maintenance** section of the form.

Particulate filter replacement

The filter replacement procedure is taken from the 9810A&B Ozone Analyzer Service Manual. For figures and details on part numbers consult this manual.

Change particulate filter:

- Open the front panel to access the service switches and particulate filter. Position the Pump switch in the secondary front panel to OFF. For the B series Analyzer, you will need to disconnect the external pump.
- Completely unthread the filter cap by turning it counterclockwise.

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- Pull the filter plunger out of the body, carefully resting it in a secure place. The O-ring and filter membrane are now exposed inside the filter body.
- Remove, inspect, and wipe down the O-ring. Replace the O-ring only if damaged.
- Remove, discard, and replace the old filter membrane.
- Reinstall the O-ring over the new membrane, reinstall the plunger, and handthread the cap back into place by turning it clockwise. Do not use tools.
- Return the Pump to ON.
- Close the front panel.
- Enter **Y** in the **Particulate filter changed** field if it was changed. Otherwise enter **N**.

Ozone scrubber replacement

The ozone scrubber replacement procedure is taken from the 9810A & B Series Ozone Analyzer Service Manual. For figures and details on part numbers consult this manual.

Change ozone scrubber:

- Press the Power switch to the OFF position.
- Unscrew the retaining nut located on the elbow of the scrubber to be changed. Disconnect the tubing from the joint.
- Remove the scrubber from the retaining clip. See Figure 15.
- Unscrew the retaining nut on the elbow joint at the bottom of the scrubber. Disconnect the tubing from the joint.
- Connect the tubing to the new scrubber and tighten the retaining nut at the bottom of the new scrubber.
- Press the scrubber into the retaining clip and connect the tubing to the top elbow joint. Tighten the retaining nut.
- Replace the top cover and close the front panel.
- Enter **Y** in the **Ozone scrubber changed** field if it was changed. Otherwise enter **N**


Finalizing the visit and completing the form

- Enter the end time of the calibration in the **Time Begin/End** field (right field) in the form.
- Sign the form in the **Technicians Signature** and **Date** fields.
- Before leaving the station record the visit in the station visit log.
- After returning to the lab store the form in the instrument history log book.

Relevant documentation

DLI-QD-103

Form *DLI-F-39 O3 Analyser Maintenance Report*

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Reference Procedures

Ozone monitor (Ecotech EC9810) manual

Revision History

Revision 0