

## Danalyzer gas chromatograph

### Upgrade options

Due to various regulatory and manufactures changes and obsolescence of spare parts, we offer several upgrade options as follows.

These upgrade options are specific to the Model 500 Danalyzer® gas chromatograph produced by Emerson Process Management® formally Daniel Industries Ltd® and Daniel Industries Inc.®

These upgrade options are applicable at January, 2010. Please contact Analytical Engineering for up-to-date information.

### 1. Chromatographic valve and column upgrade

Old C6+ instruments have typically 7½ minute analysis times and use the now obsolete 8-port chromatographic valves and C6+ column set. These items are no longer available from the manufacturer as spare parts. Instrument can be upgraded to current production 6-port, 220 Sec types. This requires replacement of chromatographic valves and column set and installation of a sample shut off valve. Additionally, Analytical Engineering Limited replaces the carrier regulator, insulating thermal jacket and all small bore analytical pipe work. Upgrade includes determination of new configuration and parameters.



*The above photograph shows the instrument undergoing a chromatographic valve upgrade. Two of the three 6-port chromatographic valves can be seen. The sample shut off valve is the rectangular device mounted on the plate in the centre.*

The upgrade would be a requirement should either an old 8-port chromatographic valve or 7½ minute column fail and require replacing. Normally this occurs due to liquid entering instrument.

Spares required are normally available ex-stock. We also can carry out installation and commissioning as may be required.

## 2. Actuation valve upgrade

Originally C6+ and C7+ Danalyzers were fitted with ASCO actuation valves (green in colour and manufactured using cast iron). These are no longer available due to introduction of ATEX regulations. Analytical Engineering Limited were contracted to design and manufacture an upgrade kit by National Grid (formally Transco). This kit became the standard approved upgrade kit for use on National Grid Danalyzers and in excess of 150 kits have been supplied. This kit replaces original ASCO valves with new ATEX certified Alcon valves. The Alcon valve is currently used on production Danalyzers. This kit is normally available ex-stock. Also, we can carry out installation as may be required. The image below shows the actuation valve kit in place (please refer to the upper part of the photograph below).

### Note.

If preferred by our client we can upgrade the instrument utilising ASCO ATEX certified actuation valves as opposed to the Alcon type as used on the current production analysers. The ASCO valve contains no internal pcb that could fail. This option would require some element of engineering prior to its deployment. **Please contact us for further details.**

## 3. Stream selection valve upgrade

Originally C6+ and C7+ Danalyzers were fitted with ASCO stream selection valves (also green in colour and manufactured using cast iron). These valves are no longer available due to introduction of ATEX regulations. Analytical Engineering Limited designed an upgrade kit and several operators have been supplied replacing the original ASCO valves with new ATEX certified ASCO valves.

Instruments can have 2, 3, 4 or 5 inlet streams. Accordingly, analyser would have respectively 1, 2, 3 or 4 older non-ATEX, ASCO stream selection valves depending on the number of inlet sample streams.

### Two upgrade options are available.

- (i) Utilising the current ATEX certified Alcon stream selection valve as used on current production Danalyzers. This option requires considerable pipe work changes on the instrument and consequently can become considerably more expensive compared to option (ii) following. This is not our recommended upgrade option.
- (ii) Utilising the ATEX certified ASCO valve introduced by ASCO Joucomatic to replace its previous non-ATEX valve. This valve upgrade requires no pipe work alterations on the actual instrument and can be installed in considerably less time than option (i) above. Also, the ASCO valve has proved very reliable and contains no internal pcb that could fail.

Analytical Engineering recommends installation of ASCO ATEX certified stream selection valves.



*Photograph shows: ATEX approved Alcon actuation valves (top) and ASCO stream selection valves (below).*

## 4. Controller upgrade

Many analysers are operating with the 2551 controller. However, the 2551 controller is now considered obsolete and spares and support are no longer, to our understanding, available from OEM.

Analytical Engineering can maintain the 2551 controller.

Should you wish to replace your existing 2551 controller with the current production 2350A (either 19" rack mount or hazardous area installation variant) we can supply the engineering and instrument(s) to implement this upgrade. Inevitably some element of engineering will be involved to integrate the new much larger controller into your existing instrument panel. This design, integration and installation can be supplied by Analytical Engineering Limited.

For further details please refer to the Danalyzer page on our website or contact us directly.



**Left:** A typical 2551 controller installed adjacent to an Omni flow computer. The problem on this installation is lack of front panel space for the new 19" rack mount 2350A controller. We designed a new front panel to resolve this issue.

**Right:** 2350A controller, display, keyboard and Omni installed in our new front panel. Note: a new flat screen monitor has been installed. Monitor bezel not yet fitted.

**Centre:** Our new front panel with 2350A controller mounted behind and within the 19" rack.



**Left:** 2350A controller installed using our specially designed mounting angles within the rear of the rack (space vacated by removal of older CRT monitor). Note: all electrical connections to 2350A are readily accessible.

Additionally, we offer system upgrades as follows:

## 5. Flexible cylinder connections

All Danalyzer chromatographs require a suitable supply of UHP He and certified calibration gas. These are typically supplied from cylinders. Typically the cylinders are connected to pressure let down systems using fixed rigid pipe work. The nature of this mechanical installation is excellent from the points of view of both high pressure rating of rigid pipe work and purity of gas supply. However, mechanical rigidity does not lend itself to the connection of cylinders of varying size (normally height but also diameter). Additionally, it is not unknown for technicians to inadvertently loosen connections with the result of total gas loss which is not only expensive but also potentially highly dangerous.

Analytical Engineering Limited offers a variety of flexible hose connections that overcome the problems associated with rigid cylinder connections. These typically use flexible stainless steel hoses for hydrocarbon gases (typical maximum cylinder pressure of 100barg) and thermoplastic hoses for He (typical maximum cylinder pressure of 200barg). Our installation includes isolation and purge valves and is intended to be integrated into an existing system.

Inevitably some element of engineering may be required to complete the upgrade.

Regards UHP He supply, we can also supply auto-change-over regulators as part of a new or upgraded system. We would recommend GO COM2B regulators as they have, to us, proved most reliable and can be very easily site serviced without the need for special tooling.



**Left & Centre:**  
Hydrocarbon  
calibration gas  
cylinder(s) connected  
using flexible 316SS  
hose(s) mechanically  
strong due to use of  
½" NPT and ½"  
Swagelok fittings.

**Right:** 200bar UHP He cylinder. Connection made with high pressure thermoplastic hose. Hose has a protective SS spiral fitted to give better abrasive resistance. Again, ½" NPT and ½" SS Swagelok fitting provides excellent mechanical rigidity.



## 6. Process sample inlet upgrade - preventing liquid ingress

As the instruments name suggests it is a *Gas Chromatograph* and one of the reasons for a number of instrument failures is ingress of liquid from the process stream. Typically this would be oil, condensate, water or a mixture of all three. Any liquid entering a Gas Chromatograph can cause considerable damage. This can prove to be expensive to rectify in terms of both cost and down time.

Prevention is often better than cure. At Analytical Engineering we offer various options to trap and prevent liquids from entering an analyser. These range from simple sample filter systems (coalescing and by-pass) to systems that monitor sample line for presence of liquid and other contaminants and close valve(s) that isolate instrument.

These options are adaptable and require to be tailored to your specific installation requirements. **Please contact us for further details using the e-mail details as given on our website.**