SERVICE REPORT

Job Number:	SE0746		
Customer:	University of York		
Contact:	Maria Fontanals-Coll		
Instrument:	PyroEarth and HS 20-22 (20402/4-2022/1284)		
Date of Visit:	08 Apr 26	Days:4	
Engineer:	Henry Connell Cooke		
Reason for Visit:			
Service			
Service Contract?	Yes		
Warranty?	No	Expires:	N/A
Details of Visit:			

Day 1

- Arrived to results from customers own standards as a precision pre spec: CO2 = 0.07 ‰ N2 = 0.08 ‰
- Customer had changed the reduction tube and combustion liner in advance of the visit
- Peak shapes found but no ref gas run
- System switched off and source removed. Multiple loose screws inside the source needed changing, old filament looked typically worn, no shorts detected
- Oil changed in rotary pump, old oil looked typically brown
- System switched back on and filament conditioned at 1.2E-7 after ~2 hours

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Day 2

- Ultimate 1.0E-8 vacuum reached overnight
- CO2 tuning completed. For good tuning to be possible, a very negative HP is required, with best ref gas linearity coming from a tuning with -75 HP, suggesting magnet position is not optimised for CO2
- CO2 Ref precision = 0.04 ‰ and linearity 0.30 ‰
- N2 peak shapes needed more typical tuning, but had abnormally high sense due to a high ref flow rate of ~3-4 mL/min
- 0.01 ‰ N2 precision found, but no good linearity could be found at this point, possibly due to the 50+ nA sense
- First combustion precision run completed, CO2 = 0.06, N2=1.05
- Further N2 tuning completed and another combustion run started to run overnight

Day 3

- N2 results were no better and CO2 results were significantly worse, with odd peak shapes suggesting incomplete combustion
- O2 pulse increased from 10 to 20 seconds, and the wait between the end of the pulse to the sample drop was decreased from 15 to 5 seconds
- N2 ref gas line was crimped down to give ~10nA rather than 50, and significantly more linear tuning was found. N2 ref precision = 0.02 ‰ and linearity = 0.04 ‰
- Combustion precision completed N2= 0.06 ‰ with consistent peak shapes, and CO2 = 0.03, but still with an odd peak shape suggesting combustion problems
- Combustion furnace cooled down over lunch before customer changed the tube at ~250°C. Furnace cooled from 950 to 250 in ~40 minutes, quicker than expected.
- When furnace was heated up, it would no longer pass pressure test
- Attempts were made for the rest of the day to find the cause of the leak, before pressure test was finally passed at the end of the day, by bypassing the autosampler

Day 4

- Autosampler removed, stripped and cleaned of all PTFE shavings. New combustion tube made up and replaced the previous, potentially leaky one.
- Pressure tests were carried out with the bypass link while the autosampler was being cleaned, and while they were better than with the autosampler itself, it still dropped by 4 PSI over 5 minutes
- Clean autosampler replaced bypass link and pressure test passed, suggesting there is now a leak in the bypass link
- Furnace heated back up and samples dropped. CO2 once again had a odd peak shape, likely still poor combustion. Combustion furnace increased from 950 to 990°C and peak shapes improved
- Autosampler started to turn inconsistently so screws were slightly loosened. 10 empty capsules dropped as they should
- Blanks sitting less than 5E-10, as typical for this instrument

Follow Up:

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Please email me henry.cooke@sercongroup.com or support@sercongroup.com if you have any questions in the future

Parts Used:	*Quantity:*	*Charge:*
		N/A
Total:		N/A

Engineer: Henry Connell Cooke Date: 24 Jul 2026

Signed: Henry Connell Cooke

Customer: MARIA FONTANALS COLL Date: 24 July 2026

Signed: