SERVICE REPORT

Job Number:	SE0784		
Customer:	Plymouth Marine Laboratory		
Contact:	Andy Rees		
Instrument:	Europa EA-GSL (10202/5-2017/1146) with Hydra 20-22 (20402/1-2017/1146)		
Date of Visit:	23 June 2026	Days:3	
Engineer:	Henry Connell Cooke		
Reason for Visit:			
Service visit			
Service Contract?	Yes		
Warranty?	No	Expires:	N/A

Details of Visit:

Day 1

- Arrived to a hot system with N2 ref gas but no CO2
- N2 ref gas specs ran: Precision = 0.10 ‰ and Linearity 0.31 ‰
- Combustion precision ran: N2 = 0.31 ‰ and CO2 = 0.03. Separation between peaks appears minimal, but CO2 results are good, so it is not causing an issue
- System switched off, source removed and filament swapped for new. Old filament looked well worn, but apparent issues with the source
- Oil changed in rotary pump. Pump sat in tray to collect leaking oil, the tray was almost overflowing, suggesting leaky pump. Old oil was typically discoloured
- System switched back on and vacuum formation started quickly, suggesting old turbo pumps are still in good health
- Combustion, reduction and water trap tubes were swapped for new, with customer trained in how to make up, change tubes and check for leaks
- Pressure test passed at 400°C after all the tubes were changed. Reheat of both furnaces started
- Filament conditioning attempted once vacuum reached E-8. The system did not respond to switching on the source switch. Vacuum did not increase like normal, 'Limit' waring did not remain for longer than a second, and trap value remained at 74 rather than dropping to 0 as expected
- Initially no short circuits were present, but after the system was shut down and filament changed again; a short appeared between trap and HT. Removing the trap fully revealed the longer, thin ceramic covering the trap screw had practically disintegrated.
- System left to pump down overnight with a new ceramic and new filament, for filament conditioning in the morning

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Day 2

- Arrived to a vacuum of 2.3E-8
- Filament conditioned quickly this time, only needing ~3 switches, and barely reaching E-6 vacuum in the process
- Pressure tests passed at full furnace temperature. When closing the first valve of the trapping loop (V9) pressure dropped from 22 to 21 PSI over 5 minutes. When using the second valve (V10) pressure dropped from 22 to 20 PSI over 5 minutes, suggesting there may be a very small leak on the trapping loop
- ~2 hours after conditioning, the source was switched to CO2 mode. CO2 peak was trapped from a sample, since there was no ref gas. Peak shape looked good
- N2 tuning and trap jumping completed to find the best linearity. The peak shape with the best trap jumping also gave the best linearity result of 0.18 ‰, and a precision of 0.13 ‰
- Precision specs ran: N2 = 0.14 and CO2 = 0.03
- Linearity run started before leaving for the day

Day 3

- CO2 linearity = 0.12‰. N2 linearity = 0.22 ‰ when linear regression was set to false, or 0.15 ‰ when set to true. For the precision run on day 2, N2 = 0.14 ‰ with false regression, or 0.19 ‰ with true. It is up to the customer whether they want to set N2 regression to false to optimise precision, or true to minimise the linearity effects
- Extended linearity run to test the limits of the system. This run measured ~5-200ug N and 12.5-500ug C instead of the typical 20-200ug N and 50-500ug C. This run gave results of N2 = 0.25 ‰ and CO2 = 0.33 ‰. This suggests that the system is capable of running samples down at these low levels, with linearity effects that are present but manageable
- Customer advised that it's a good idea to run a TEST sample before the first reference point, since the very first sample out of the system tends to be slightly less accurate. Also that there should only ever be maximum 12 samples between reference points, to minimise drift
- Customer shown how to safely shut down the system, due to the likelihood of a power cut overnight

Follow Up:

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

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

Engineer: Henry Connell Cooke Date: 25 Jun 26

Signed:

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Customer:	Andy Rees	Date:	03.07.2026
Signed:			

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