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ABCA2 Maintenance Report

Job Number:	SE0785 (ABCA 2)		
Customer:	Grand Hopital de Charleroi		
Instrument Serial #	20602-201215	Gas Box Serial #	10602-201216
ASX 7400 Serial #	011204A7400	Software Version	V800.10.0
Contact:	Cecile Bohez		
Date of Visit:	19 Oct 26	Days	2
Engineer:	Henry Connell Cooke		

Pre-Maintenance Checks

Initial Tuning Parameters

HT	**2592**
Focus	**87**
HP	**-15**
IR	**-7.0**
eV	**-80**
Trap	**300**
Emissions	**~850 (300 Trap)**
Vacuum	**$1.8e^{-8}$**

Initial Performance Evaluation

Test	Result	Sheet Number
Peak Shape	**Pass**	**1**
Stability	**Fail**	**2**
Ref Gas Precision (std dev ‰)	**0.28**	**3**
Linearity, 0.5% - 8% CO_2, n=6 (std dev ‰)	**1.68**	**4**
Breath Precision (std dev ‰)	**0.71**	**5**

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Maintenance Checklist

Source and Filament Change	Initial: HC	Date: 19 Oct. 26
Oil Change	Initial: HC	Date: 19 Oct. 26
Filament Condition	Initial: HC	Date: 19 Oct. 26
Tune Optimisation	Initial: HC	Date: 22 Oct. 26
Replace Syringe O Rings	Initial: HC	Date: 19 Oct. 26
Gas Flow Check and Optimisation	Initial: HC	Date: 22 Oct. 26
Magnet Position Optimisation	Initial:HC	Date: 22 Oct. 26
System Leak Check	Initial: HC	Date: 22 Oct. 26

Final Source Conditions

HT	**2596**
Focus	**86**
HP	**-12**
IR	**-6.0**
eV	**-80**
Trap	**300**
Emissions	**~810 (300 trap)**
Vacuum	**1.0E-08**

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Final Performance Evaluation

Test	Result	Sheet Number
Peak Shape	**Pass**	**6**
Stability	**Pass**	**7**
Ref Gas Precision (std dev ‰)	**0.09**	**8**
Linearity, 0.5% - 8% CO_2, n=6 (std dev ‰)	**0.63**	**9**
Breath Precision (std dev ‰)	**0.19**	**10**
5% CO_2 in Tube Precision (std dev ‰)	**0.20**	**11**
Sensitivity (peak height from 5% CO_2, amps)	**9.8E-09**	**12**

Notes

Day 1

- Emergency service due to customer complaints of no peaks after changing needle. Peaks were present from the start, suggesting customer had leaky samples rather than a leaking system
- Pre specs gave poor results as seen above, likely due to instability, with spikes present in the stability trace
- System switched off and source removed. Old filament looked fine and no obvious problems with source. New filament, magnet grub screws, copper gasket and flange screws added
- Oil changed in rotary pump. Old oil was still light in colour
- O rings changed in syringe
- CETAC recalibrated to make sure the needle does not hit the side of a tube and break again. It was noticed that the white blocks are different enough that they cannot be interchanged. If the order of white blocks is swapped then the needle will likely break again
- System switched back on and pumped down to 2.3E-7 in ~2.5 hours before filament was successfully conditioned

Day 2

- Arrived to a vacuum of 3.1 E-08
- Peak shape found and tuning completed, but stability was very poor. Spikes and noise happening inconsistently
- Ref gas and breath results inconsistent, likely due to instability
- Head amp/cable checked along with source cable whilst rotary pump was ballasted. No faults seen
- Stability trace improved with ballast, but breath precision did not improve, with variable beam areas present

- No leaks detected from needle or syringe, but 1/16th nut connected to the top of syringe block felt very still when untightening. The ¼-1/16th union that enters the syringe block was found to have lost its thread, and a replacement was needed. No replacement on hand, so the job must be completed once the correct replacement union is required

Day 3

- Arrived to a vacuum of 1.0E-08 with correct fitting wrapped in PTFE tape, tightened into syringe block and screwed all lines back in place
- Rotary pump ballasted further, stability is improved but still not perfect
- Initial breath testing still showing varying beam areas. Syringe and all surrounding fittings tightened, as well as both sides of the peek tubing
- Breath tests now have consistent beam areas, and pass specs after tuning. Magnet height was also altered to increase sensitivity
- Tuning continued through the day, but n=6 linearity never got better than 0.63. Higher than ideal, but still usable. Final specs seen above

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Follow Up

. Please email henry.cooke@sercongroup.com or support@sercongroup.com if you have any questions

Engineer:	Henry Connell Cooke	Date:	22 Oct. 2026
Signed:			
Customer:	Bohee Cook	Date:	23/10/26
Signed:			

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