

SERVICE REPORT

Job Number:	IN1325	Quote:	Sage:
Customer:	SDS, South Dakota, USA		
Contact:	Janet Miller		
Instrument:	HS2022, IsoEArth		
Date of Visit:	26 th – 28 th March 2025	Days:	3
Engineer:	David Harris		
Reason for Visit:			
Replacement reduction furnace and prep PCB required under warranty.			
Service Contract?	Yes / No	Expires:	N/A
Warranty?	Yes / No	Expires:	
Tick as Applicable:	Call Out / Routine Service / Warranty / Emergency / Contract Visit		
Details of Visit:			
Arrived on site and inspected instrument. Furnaces are cooled off. No reaction tubes present. Customer had reported runaway reduction furnace possibly due to comms drop out issue. Customer reports that sometimes the software will have closed itself during the night, possibly from Windows 11 updates. PC is not currently online and all updates have been reduced as much as Windows allow. Furnace damaged by burst reduction tube containing melted copper. Also O₂ readbacks not functioning correctly Test functionality of instrument. Software is lagging. Readback cycle delayed round-robin. Furnace heats to 100°C OK but melted copper damage visible. Cooled off reduction furnace and removed from unit. Replaced with new furnace sent from Sercon. Notice that TCD heated box is hot. Readbacks set to incorrect scale. Adjusted jumpers on PCB scale now correct so correct readback can be shown. Customer does not use TCD analysis. Set TCD heater to 0. Removed detector beam from view on Callisto. Removed original Prep PCB and replaced for new. Lagging issue now resolved. All readback good. O₂ readbacks respond correctly. Moved USB comm cable to USB2.0 port on PC. Adjusted PC scheduled update parameters so system cannot update outside of office hours. New furnace response as normal – All OK. Set to 600°C over night to test – All OK. Cooled off furnace and installed reaction tubes made by JM. – All OK. Leak checked system – All OK.			

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Retuned settings as required using CO₂ & N₂ Ref Gas. Ran checks & specs...

Ref Gas

CO₂ Peak Shape = OK

CO₂ Stability = OK

N₂ Peak Shape = OK

N₂ Stability = OK

Ref Gas ¹³C (n=5) Precision = 0.019‰ S.D.

Ref Gas ¹³C (n=5) Linearity = 0.102‰ S.D.

Ref Gas ¹⁵N (n=5) Precision = 0.018‰ S.D.

Ref Gas ¹⁵N (n=5) Linearity = 0.073‰ S.D.

IsoEarth

AS Beet Mix (C 400µg, n=5) ¹³C Precision = 0.017‰ S.D.

AS Beet Mix (N 100µg, n=5) ¹⁵N Precision = 0.051‰ S.D.

Wheat Flour (n=5) ¹³C Precision = 0.017‰ S.D.

Wheat Flour (n=5) ¹⁵N Precision = 0.087‰ S.D.

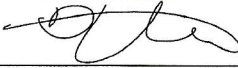
System under low pressure, adjusted crimp to original Vac pressure at 3.1e-06mBar (matching install) – All OK.

Dropped GC temp setting to 60°C to improve N₂ & CO₂ chromatography peak separation, extended run by 30sec for run off.

Customer ran batch own standards (Wheat Flour) Adjusted timing windows as required for batch.

System handed back over to customer for normal usage.

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Recommendations:			
- If comms loss occurs, reload and re-save flows and temp settings when comms reestablished. - Recommend preventive maintenance service contract which includes rotary pump oil change and new filament installation.			
Follow Up:			
N/A			
Parts Used:	Stock Number:	Quantity:	Charge:
IsoEArth prep PCB		1	Included in warranty
Reduction furnace		1	
		Total:	N/A
Engineer: David Harris		Date: 28 th March 2025	
Signed: 			
Customer: Janet Miller		Date: March 28, 2025	
Signed: 			

NOTES:

N/A