SERVICE REPORT

Job Number:	SE0734 Quote: Sage:		
Customer:	Food Forensics, Norwich, UK		
Contact:	Alison Johnson, Eleana Pappa, Pranay Manimala, Claire Burman		
Instrument:	20-22, HS2022, IsoEarth+, HTEA		
Date of Visit:	27/10/2026 Days: 3		
Engineer:	Thomas Iordanidis		
Reason for Visit:			
Service x2 IRMS HYDRA 20-22 and Troubleshooting Visit			
Service Contract?	**Yes** / No	Expires:	31 JAN 2027
Warranty?	~~Yes~~ / No	Expires:	N/A
Tick as Applicable:	~~Call Out~~ / Routine Service / ~~Warranty~~ / ~~Emergency~~ / Contract Visit		
Details of Visit:			

Sercon Ltd
Europa House, Coppicemere Drive
Crewe, Cheshire
CW1 6GZ U.K.
Company Registration No.: 4290072
Phone: +44 (0) 1270 580008
www.sercongroup.com
VAT No.: 771 1100 74

SERVICE REPORT

Arrived on site and inspected all instruments – all okay

During this visit the two 20-22 IRMS will be serviced and the HS2022 will be troubleshooted with the returned repaired Emag and System Controller

IRMS HYDRA 20-22 + HT-EA Interface (IRMS 2) – HD & O2 Analysis:

- System in good condition – rotary pump running very low on oil and a significant leak can be seen in the tray – to be investigated
- Ran HD Peak Shape, Stability Scan & Reference Gas precision PRE-SERVICE to assess system performance as magnet was set to HD mode (see results below)
- System vented, removed Source, removed old filament. Fitted new filament. – All OK. Replaced grub screws and fitted new copper gasket and PTFE ferrule to inlet. – All OK.
- Spare rotary pump was found and filled up with oil – when pumps were turned on smoke was observed from the exhaust nozzle, so it was decided this pump is to be put out of action and to be disposed
- After discussing the options with the customer it was decided to fit the original rotary pump to the system – O-ring seems in good condition with no visible damage, old oil obvious discolouration, pump filled up with new Edwards-15 oil and all fittings were tightened to avoid leaking. Pump was fitted back on system by customer for training purposes in case a new rotary pump has to be fitted in the future
- Source continuity checked on bench top and in flight tube – all OK
- Pumped down instrument – at a vacuum of 1.6E-7 the filament was successfully conditioned with good emissions for standby, HD & CO tuning - All OK – filament left for a few hours to degas
- A much better HD peak shape and stability were obtained with the new filament and good results for reference gas precision, cystine precision and a customer standard batch (see results below)
- Customer requested for oxygen to be tested as well during the visit so magnet left heating up overnight
- A good CO peak shape and stability were observed with the new filament and good results for a cystine precision and a customer standard batch (see results below)
- Long overnight O2 customer sample batch gave satisfactory results

PRE-SERVICE:

HD 2/1 Peak Shape: OKAY

HD 2/1 Stability: PASS

HD Reference Gas Precision: 0.920‰ S.D.

POST-SERVICE

HD 2/1 Peak Shape: PASS

HD 2/1 Stability: PASS

HD Reference Gas Precision: 0.247‰ S.D.

HD Cystine Precision: 0.644‰ S.D.

18O (CO2 Ref gas) 3/1 Peak Shape: PASS

18O (CO2 Ref gas) 3/1 Stability: PASS

18O Cystine Precision: 0.318‰ S.D.

System passes all specification after service – system handed back to customer for normal use

SERVICE REPORT

IRMS HYDRA 20-22 + GSL + ISOEARTH+ (IRMS 1) – CNS Analysis:

- System in good condition with no reported issues from customer
- Ran CO2 & N2 Peak Shapes, Stability Scans and Reference Gas Precision & Linearity to assess system performance prior to the service (see results below)
- System vented, removed Source, removed old filament. Fitted new filament. – All OK. Replaced grub screws and fitted new copper gasket and PTFE ferrule to inlet. – All OK.
- Source continuity checked on bench top and in flight tube – all OK
- Rotary pump removed, inspected, drained and filled up with new Edwards-15 oil & reconnected
- System is a very slow pumper due to the old pfeiffer pumps – filament was conditioned by day 2 at a vacuum of 1.2E-7 and left to degas overnight **(system reads 0 emissions on standby source file – same as pre-service) –** vacuum reached 7.9E-8 by Day 3
- Ran CO2 & N2 Peak Shapes, Stability Scans and Reference Gas Precision & Linearity to assess system performance with the new filament (see results below) – specifications passed
- Trapped and tuned sulphur through the IsoEarth+ with good peak shape and stability
- Instead of running a precision batch it was decided to fine tune the 20-22 and investigate the high blank issue reported through the GSL
- GLS leak checked, looks like the oxygen line needs to be purged for longer prior to use as that brought the nitrogen blanks down to 2E-10 – A CO2 blank was only seen in the first blank if this keeps appearing or the beam area increases the GC might need a bake out

PRE-SERVICE:

CO2 2/1 Peak Shape: PASS	13C Precision: 0.054‰ S.D.
CO2 2/1 Stability: PASS	13C Linearity: 0.220‰ S.D.
N2 2/1 Peak Shape: PASS	15N Precision: 0.055‰ S.D.
N2 2/1 Stability: PASS	15N Linearity: 0.087‰ S.D.

POST SERVICE:

CO2 2/1 Peak Shape: PASS	13C Precision: 0.032‰ S.D.
CO2 2/1 Stability: PASS	13C Linearity: 0.162‰ S.D.
N2 2/1 Peak Shape: PASS	15N Precision: 0.046‰ S.D.
N2 2/1 Stability: PASS	15N Linearity: 0.149‰ S.D.
SO 3/1 Peak Shape: PASS	SO 3/1 Stability: PASS

System passes all specification after service – system handed back to customer for normal use

HS2022 (IRMS 3) + ISOEARTH+ :

- Prior to my visit the customer ran long stabilities whilst connecting the repaired Emag and System Controller – combinations with the repaired magnet resulted in significant spiking
- On my arrival the system was connected on the repaired magnet and old system controller – some spiking was observed and spiking was significantly worse when the new system controller was also installed
- Given the wavy nature and consistent spiking this seems to be linked to the UPS supply
- After a discussion with the customer it was decided to put back on the old magnet to rule out the repaired magnet causing the spiking issue

SERVICE REPORT

- With the old Emag and old system controller no spiking was observed over 5 hours
- Repaired system controller was reconnected with the original magnet and no spiking was present for 2 hours and a long 6 hour overnight stability
- It was decided to optimise system with this set up: original magnet and repaired system controller
- Started tuning CO2 and N2 running peak shapes, stabilities and reference gas specifications (see results below) – specifications met
- Trapped and tuned sulphur through the ISOEARTH+
- Flow sensor in ISOEARTH+ calibrated after customer request
- CO gives good peak shape and stability and there is some coincidence for Hydrogen but due to limited time it was not set up – different magnet positioning or tuning might be required for HD
- Given the wavy nature of the stability linking to a possible issue with the UPS supply, since it is not possible to connect the system to a mains plug this cannot be ruled out. It was decided to connect the original set up (old magnet + system controller) to see if the wavy nature of the stability appears as this will rule out an issue with the system controller. This was confirmed after a long overnight stability as the wavy pattern was present and since the system was performing well in this set up although of the wavy nature of the stability it doesn't seem to be affecting system performance. System to be left with repaired system controller and old magnet, the rest will be taken back to SERCON for assessment

Reference Gas Specification (Old magnet + Repaired System Controller)

CO2 2/1 Peak Shape: PASS	13C Precision: 0.036‰ S.D.
CO2 2/1 Stability: PASS	13C Linearity: 0.056‰ S.D.
N2 2/1 Peak Shape: PASS	15N Precision: 0.038‰ S.D.
N2 2/1 Stability: PASS	15N Linearity: 0.081‰ S.D.
SO 3/1 Peak Shape: PASS	SO 3/1 Peak Shape: PASS
18O (CO2 Ref gas) 3/1 Peak Shape: PASS	18O (CO2 Ref gas) 3/1 Stability: PASS

System passes all specification after service – system handed back to customer for normal use

Recommendations:

Keep an eye on the oil level of the IRMS2 rotary pump – if this carries on leaking a new rotary pump will be required for the system

Faulty autosampler (not turning with a second rack): After a thorough inspection I concluded that the issue lies with the wheel itself as the autosampler was getting stuck on the same position every time whilst the second tray was installed applying a greater weight on it – this will be taken by myself back to SERCON for repair

Keep testing IRMS3 with the repaired system controller, it would be useful if you can find a way to plug it straight into a mains supply to see if the wavy stability pattern will be present as this will rule out an issue with the UPS itself

Follow Up:

The repaired magnet that resulted in spiking will be taken by myself back to SERCON alongside the faulty autosampler for repair

Please contact us at service@sercongroup.com if you have any future questions or problems with the instruments going forwards.

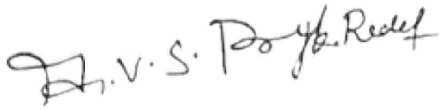
SERVICE REPORT

Parts Used:	*Stock Number:*	*Quantity:*	*Charge:*
Service Kit	SC9001	2	N/A
Edwards Ultra 15 Pump Oil	N/A	2	N/A
		Total:	N/A

Engineer: Thomas Iordanidis Date: 29/10/2026

Signed: 

Customer: Pranay Manimala Date: 04/11/2026

Signed: 

NOTES: N/A