

CONTENTS PAGE

Client:	The Ohio State University		
Quotation Number:	16671	Date:	17/04/2023
Job Number:	IN1316	Date:	15/05/2023

- ☒ 1 QUOTATION
- ☒ 2 CUSTOMER ORDER
- ☒ 3 MACHINE SPECIFICATION DOCUMENT_S027_v11
- ☒ 4 LOG SHEET_S028_v3
- ☒ 5 FAULT REPORTING DOCUMENT_S029_v3
- ☒ 6 TEST ACCEPTANCE SPECIFICATION_S030_v9
- ☒ 7 ASSEMBLY AND TEST RECORD_S023_v5
- ☒ 8 SERIAL NUMBER FORM_S053_v4
- ☒ 9 TEST DATA
- ☒ 10 PACKING LIST_S035b_v6
- ☒ 11 INSTALLATION REPORT_S057_v6
- ☒ 12 INSTALLATION ACCEPTANCE AND WARRANTY CERTIFICATE_S071_v3

ADDITIONAL:

Payment Terms:

50% / 40% / 10%

Other: please specify

Penalty Clause Yes / No

Please specify:

Blue Book Completion:

Signed	<i>G. O'Connor</i>	Date	24/4/24
Verified	<i>S. Allen</i>	Date	24/4/24

3 - MACHINE SPECIFICATION

Client:	The Ohio State University		
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Ref No.	Product Description	Required
HS2022 (continuous flow)		
20402/1	HS2022 Ref Gas + P Mag	
20402/2	HS2022 Ref Gas + E-Mag	
20402/3	HS2022 Ref Gas + Hd Collector + E-Mag	
20402/4	HS2022 Ref Gas + Hd Collector+E-Mag+Trap Loop	
20501	Hd Collector Assy	***
50101/2	Trapping Loop Assy	
70201-1	70201-1 Analyser spares kit – Included	
EA Units		
10202/11	iso-EArth	
10202/13	iso-EArth+	
10202/14	iso-Earth HT Furnace Upgrade	
10202/15	Iso-Earth (Without Autosampler)	
11802/1	Earth+PC	
11802/2	EArth+Clarity+PC	
70501-1	Consumables for C and N for Combustion Only	
70501-11	Simultaneous CNS Consumables Kit (approx. 10000 analysis)	
70501-3	Sample Prep Kit (Inc.)	Y
70501-4	GSL Combustion and Gas C & N Start Up Kit	
70501-5	Simultaneous NCS Consumables Kit	
70501-6	C&N Combustion Only Consumables Kit (approx. 5000 samples)	Y
70501-8	Simultaneous CNS Consumables Kit (approx. 5000 samples)	
70601-1	Sulphur Start Up Kit (Inc. with Sercon EA Systems)	
70601-2	Sulphur Consumables Kit for 1000 Samples	
70601-4	Sulphur Consumables Kit (approx. 5000 Samples)	
70801-2	Pyrolysis Consumables Kit-Low temp for Solids	Y
71701-1	Sub Microgram Nitrogen Analysis Start Up Kit	
SI2040	PN150 Pneumatic Autosampler with one no.50 pos, carousel	
SI2345	ME Micro Balance	
SI2737/A	Sercon 50 Position Autosampler Assy	
SI2789	Extra 50 Position Carousel	
SI2744	Automatic Liquid Sampler 15 Position	
SI2743	Liquid Sampler Mounting Plate	
Headspace Equilibration		
10202/10	XYZ Gas Sampling Control Box	
10302/1	Aqua System	
11103	µCarbs for CF	
11103-1	µCarbs for DI	
11601	200 Place Dual Heated Block 240 Volt	
11801	Sercon XYZ Gas Autosampler	
71107-1	CF oxygen-18 equilibration kit	
71107-2	DI Oxygen-18 Equilibration kit	
71201-1	CF deuterium equilibration kit	
71201-2	DI Deuterium Equilibration kit	
71801-1	WES-DI start up kit (Inc. with WES-DI)	
GC Units		
10402/2	Orchid module 1500C (Will run Hd 70901-1 C Spares Kit Inc)	
10901	Nitrogen Option (71301-1 N Spares kit Included)	
HP7890/1	Agilent 7890B GC System	
HP7890/2	Agilent 7890B GC with Auto Injector	
HP7890/3	Agilent 7890B GC + Auto Injector + 150 Vial Sample Tray	
SI2561	Nexis GC 2010 Plus	

3 - MACHINE SPECIFICATION

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Ref No.	Product Description	Required
GC Units <i>continued</i>		
SI2564	Nexis GC-2030	
70901-3	GC Pyrolysis H and O Start Up Kit	
70901-4	GC Pyrolysis H Spares Kit	
70901-5	GC Combustion C Spares Kit (approx. 5000 samples)	
70901-6	GC Pyrolysis h Start Up Kit (approx. 5000 samples)	
71301-1	GC N Spares kit	
ABCA2 Units		
10502/1	ABCA2 Sercon XYZ Autosampler	
10602	ABCA2 Gas Box	
20602	Complete Sercon ABCA2 system	
20603	ABCA IR Analyser	
70101-1	ABCA2 spares kit (Inc. With ABCA2)	
70101-2	ABCA2 Spares Kit for AB Analytica Systems	
70101-3	ABCA2 Autosampler Upgrade Kit	
SI1767	CVL505 – Barcode Reader	
SC9973	13C Urea breath test kit for Helicobacter pylori infection	
SC9974	Helicobacter Test kit for children age 3-11 (45mg)	
Integra2 Units		
20802/4	Integra2	Y
70201-2	Integra2 analyser spares kit - Included	Y
70401-1	Integra-2 consumables (Inc. With Integra2)	Y
Trace Gas Systems		
10802/4	CryoPrep	
10802/5	Automated LN refiller	
10802/6	CryoFlex (TOC)	
10802/7	CryoGas	
10802/8	CryoFlex (LA)	
SI2533	Silicon Carbide Vertical Furnace	
SI2731	213nm Laser Ablation System	
SI2733	isoScell 100 sampler chamber	
71001-1	Cryoprep Spares Kit	
71001-5	CryoGas Consumables Kit	
TOC Units		
14001	Thermalox Environmental TOC-IRMS	
14002	Thermalox Environmental TOC-Standalone	
14003	Thermalox Environmental TOC-Standalone No Sampler	
SI2772	CO2 Detector, High sensitivity Option	
SI2773	NOx detector Option	
SI2774	Vacuum pump Option	
SI2775	Stirred Vial rack Option	
72101-1	TOC Start Up Kit	
72101-2	TOC Chem Pack	
72101-3	TOC & TN Instrument with heavy usage - one year	
72101-4	TOC only - economy holding	
GEO 20-22 (dual inlet)		
10702	GEO 20-22 Water Equilibration System (D & 180)	
21802/1	GEO 20-22	
21802/2	GEO 20-22 + E-Mag	

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21802/3	GEO 20-22 + E-Mag +Hd	
21802/4	GEO 20-22 Inlet	
70301-1	GEO start up kit - Included	
70301-3E	Comprehensive GEO 20-22 spares kit for 5 years operation	
HT-EA		
11501/4	HT-EA (With Autosampler)	
11501/5	HT-EA With Liquid Option	
11501/6	HT-EA Stand Alone	
11501/7	HT-EA (Without Autosampler)	
SI2622	CTC PAL3-LSI-L-S	
SI2624	CTC PAL3-Kit-Standalone	
70801-1	Pyrolysis Consumables Kit-High Temp for Solids	
71501-1	HT-EA Pyrolysis Start Up kit O and H	
71501-2	HT-EA Pyrolysis Kit for Water injections	
71501-3	HT-EA Sensitivity Start Up Kit for O & H in small samples	
71501-4	HT-EA Sensitivity Consumables Kit for O & H in small samples	
71501-5	HT-EA Sensitivity Kit for O&H in Small Samples (5000 samples)	
71501-7	HT-EA Kit for Room Temp Equilibration	
71501-8	HT-EA Pyrolysis Kit for Water injections (approx. 1 year kit)	

Ref No.	Product Description	Required
Upgrades		
12101	Evacuation System ***	
12102	2 Ref Gas+ Dilutor Box ***	
20101	Standard Source Assy ***	
20102	HS Source Assy ***	
20301	Standard Collector Assy ***	
30202/1	System Control Upgrade (Pmag) installation not included	Edwards Or Pfeiffer
30202/2	System Controller Upgrade (Emag) installation not included	Edwards Or Pfeiffer
10202/7	Preparation PCB Upgrade	
30202/3	Hijack Box ***	
30302/4	nEXT85 Edwards Pumping System Upgrade Single - installation not included	
30302/5	nEXT85 Edwards Pumping System Upgrade Dual - installation not included	
30302/6	nEXT85 Edwards Pumping System Upgrade Triple- installation not included	
SI2542	ABCA2 Upgrade Kit	
CALLISTOW	Callisto software upgrade ***	
Specials		
11702	LC-I interface	
12202	Leco Interface Unit	
SI2320	Agilent 1260 Series Refractive Index Detection HPLC System	
71401-1	ABCA-G Start Up/Spares Kit	
71401-2	ABCA-G Equilibration Spares Kit - Room temp O only	
71401-3	ABCA-G Equilibration Spares Kit - Room Temp O & H	
71601-1	LC Interface Spares Kit	
ADDITIONS		
PC	Windows 7 based PC System with Callisto Software	Y
Printer	Printer	
INST1	Installation and start up training at customer's site by Sercon Engineer	Y
INST2	Installation and start up training at customer's site by Agents Engineer	
WARR	1 year warranty	
WARR2	2 year warranty	Y
TRAIN	Training in UK for one person for 3 days	
SCONTRACT	Maintenance Service Contract – 1 year	

3 - MACHINE SPECIFICATION

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SPECIFICATION REQUIREMENTS		
Voltage	110 Volts 50/60Hzs	Y
Plug Type	SI2510 3 Metre USA/Japan plug to IEC C 13	Y
	SI2511 2.5 Metre Australian plug to IEC C 13	
	SI2512 3 Metre UK 13 amp Fused plug to IEC C 13	
	SI2523 3metre Schuko (Euro) Plug to IEC C13 Socket	
	SI2514 2.5 metre Chinese mains to IEC C13	
Pallet	Stamped for export heat treated for 30 min @ 56 °C	Y
	Complies with all Export Requirements	

3 - MACHINE SPECIFICATION

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SPECIAL REQUIREMENTS (DETAILED SPECIFICATION)

70801-4 Oxygen upgrade kit low temp is to be used in test then re packed and sent To the customer.

When the engineer is installing the system, he is to help customer pack their old GVI Instrument into the Integra shipping box along with the PC and we will arrange for it To be collected.

Approved by Sales: Garry Armstrong	Date: 19/05/2023
Approved by Tech.: Mark O'Connor	Date: 19/05/2023

4 - LOG SHEET

Client:	The Ohio State University		
Quotation Number:	16671	Date:	17/04/2023
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Date	Action Taken	By Whom
7-8-23	PC Setup and Software installed. Coms to mass spec Setup. Unit pumped down to 2.0×10^{-6} .	OW.
8-8-23	Changed gauge gasket	OW
	Tightened vent valve	OW
	Set to pump down	OW
8-8-23	He + O ₂ + Ar lines fitted + tubes made	JH
	Caps tightened + checked - all ok	JH
	He regulator gauge flapping sniffer, but line holding pressure @ 25 psi.	JH
9-8-23	He regulator gauge swapped	JH
	He pressure test	JH
	Cal controller programmed	JH
	Flow meter calibrated, flows crimped (He)	JH
	Suspected autosampler leak, swapped for bypass pipe.	JH
	V6 → V12 leak check passed	JH
	Autosampler swapped	JH
	Passed leak check	JH
	Furnaces ramped	JH
9-8-23	O ₂ carrier crimp made	JH
15-8-23	Source + collector fitted	JH
15-8-23	Set to pump down @ 15.00 hrs.	JH
	1.2×10^{-6} after 15 mins.	JH
	6.8×10^{-7} after 1 hour	JH
16-8-23	1.1×10^{-7} following morning	JH
17-8	Filament conditioned @ 9.8×10^{-8}	JH
18-8	Vacuum @ 1.2×10^{-7} in morning	JH
	Acetone squirted on source + collector	JH
	Collector pins gave feedback, vacuum now being pulled. 7.7×10^{-8} after 10 mins.	JH
	Vacuum raised back to 1.2×10^{-7} .	JH
	Isolation valve stripped + rebuilt	JH
18-8-23	Vacuum pulled into 8×10^{-8} within 30 mins	JH
21 Aug 23	Set up Head Amp - all ok	
	Set magnet on position	DHH

4 - LOG SHEET

Client:	The Ohio State University		
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Date	Action Taken	By Whom
21 Aug 23	Peak shape ok for N_2 + CO_2 . HT on high side. Vacuum has dropped to 8.0×10^{-8} mbar after 3 days pumping - post isolation valve rebuild. System carries on flashing over.	DJH
22 Aug 23	Vac down to 4.8×10^{-8} overnight. Tried to run blank batch but system will not stop flashing over. Baked out flight tube $\rightarrow$ large volume of material coming off. System fails pressure test. Found incorrect fittings on base of Comb/Ked tubes. Re-fitted Re-fitted for correct parts. Pressure test now passes ok.	
	Calibrated flow meter - All ok	DJH
23 Aug 23	Vac only down as far as 1.5×10^{-7} mbar after bake out at end of day. High background (CO) in N_2 mode. Wait to see if pumps down overnight	DJH
23 Aug 23	Vac high 1.3×10^{-7} . Background high Investigated Found leak on inlet PTFE. Vac now okay. Tried blank run but still flashes over. Left in N_2 mode to bake.	DJH
24 Aug	Flashed over in the night. Attempted new blank run $\rightarrow$ flashes over. Removed source to inspect, seemed ok replaced filament for new. Pumped down + conditioned	DJH
28 Aug	Switched on N_2 source settings @ 9.55 am to ascertain if the source will hold the H.T. Held H.T over an hour and then consequently with the valve open.	DJH JB

4 - LOG SHEET

Client:	The Ohio State University		
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Date	Action Taken	By Whom
28/8/23	Leak on the isolation valve rectified by tightening the fittings. Ran a series of blanks. H.T tripped on third sample. Used the Mega to burn off any contamination on the source. Then, restarted Blank run. Flew over after 5 samples. Found small leak on O ₂ line. H.T pins had 2 pins not quite in position. Retried Blank run? Low 10 Blanks O.K. Tuned up and instigated a Dual run. Starts still dual run	JB
29/8/23	Run failed after 5 samples - flew over. Check the Mega the source port. Could not find any shorts @ 4600V. Swapped source cable. G. Element wrong voltage swapped out for 120V. In spec for Dual 100/400 01/008 Put on customer run TERRA ANALYTIC	
31/8/23	Tuned for C+N using 400-100 μ l DUAL PREC RUN set off @ 13:00 → PASS CO ₂ 0.02	JH JH JH
31/8/23	→ PASS N ₂ 0.03	JH
31/8/23	Dual linearity not passing, 2x runs just out of spec.	JH
31/8/23	5x blanks run set off	JH
4/9/23	Auto/S grab screw leaking, sealed again. Dual linearity run PASSED → CO ₂ - 0.15 SD → N ₂ - 0.07 SD Furnaces set to cool	JH JH JH JH



5 - FAULT REPORTING

Client:	The Ohio State University		
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[illegible]

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:	The Ohio State University		
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HS20-22

Reference Gas Precision (n=5)

¹³ C	(CO ₂)	0.06	
¹⁵ N		0.06	
¹⁸ O	(CO ₂)	0.06	
³⁴ S	(SO ₂)	0.1	
² H		0.4	

Reference Gas Linearity

¹³ C	≤0.02‰/nA	
¹⁵ N	≤0.02‰/nA	

IsoEarth & IsoEarth+

Combustion (n=5)

¹³ C	100 µg C	0.1		10 µg C	0.8	
¹⁵ N	100 µg N	0.15		10 µg N	1.5	
³⁴ S	25 µg S	0.3		10 µg S	1.0	
Dual	400 µg C	0.1		100 µg N	0.15	

Integra2

¹³ C	100 µg C	0.2	
¹⁵ N	100 µg N	0.3	
Dual	100 µg N & 400 µg C	0.4 & 0.15	
³⁴ S	30 µg S	0.5	
¹⁸ O	100 µg O	0.5	

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:	The Ohio State University		
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HT-EA			
Pyrolysis (n=5)			
¹⁸ O	100 µg O or 1 µl water	0.3	
² H	200 µg H or 1 µl water	1.0	

Aqua, µCarbs & GasBox					
Equilibrations (n=5)					
¹⁸ O	0.2 ml water	0.1			
² H	0.2 ml water	2.0			
Carbonates (n=5)					
¹³ C	100 µg CaCO ₃	0.08			
¹⁸ O	100 µg CaCO ₃	0.1			
Gas Analysis (n=5)					
¹³ C	5% CO ₂	0.1		Air CO ₂	0.1
¹⁸ O	5% CO ₂	0.1		Air CO ₂	0.2
² H	0.5 ml H ₂	1.5			
¹⁵ N	0.5 ml N ₂	0.1		100 ppm N ₂ O	0.5
¹³ C	Breath (12 ml)	0.1			
DIC (n=5)					
¹³ C	15ppm (0.5ml)	0.15			

LC-I			
(n=5)			
¹³ C		0.2	

6 - TEST / ACCEPTANCE SPECIFICATION

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GC Orchid						
Combustion (n=3 for each analyte)						
¹³ C	3 Alkanes	100 ng C	0.2		10 ng C	0.5
¹⁵ N	2 Amines	100 ng N	0.5		14 ng N	1.5
Pyrolysis (n=3 for each analyte)						
² H	3 Alkanes	250 ng H	3.0		25 ng H	10.0
¹⁸ O	3 FAMES	100 ng O	0.5		20 ng O	2.0
Water pyrolysis (n=5)						
² H	0.1 µl water	3.0				
¹⁸ O	0.1 µl water	0.4				

CryoRange						
(n=5)						
¹³ C	Air CO ₂ (12ml)	0.1		Air CH ₄ (125ml)	0.2	
¹⁵ N	Air N ₂ (1ml)	0.1		Air N ₂ O (125ml)	0.4	
¹⁸ O	Air CO ₂ (12ml)	0.15		Air N ₂ O (125ml)	0.7	
¹⁸ O	Air O ₂ (1ml)	0.1				
² H	Air CH ₄	3.0				
¹³ C	TOC (5ppm)	0.4				
¹³ C	Laser					

6 - TEST / ACCEPTANCE SPECIFICATION

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Geo2			
Internal precision (no change overs)			
² H	200 Bar µl	0.15	
¹³ C	100 Bar µl	0.01	
¹⁵ N	100 Bar µl	0.01	
¹⁸ O	100 Bar µl	0.015	
³⁴ S	100 Bar µl	0.015	
Single cold finger volumes (10 change overs)			
¹³ C	20 Bar µl	0.01	
¹⁸ O	20 Bar µl	0.015	
¹³ C	3 Bar µl	0.02	
¹⁸ O	3 Bar µl	0.03	
CAPS (n=5)			
¹³ C	50 µg CaCO ₃	0.03	
¹⁸ O	50 µg CaCO ₃	0.06	
WES (n=5)			
² H		1.0	
¹⁸ O		0.05	
Manifold (10 tubes)			
² H		0.5	
¹³ C		0.02	
¹⁵ N		0.02	
¹⁸ O		0.03	
³⁴ S		0.03	

6 - TEST / ACCEPTANCE SPECIFICATION

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Special tests

Sales Signature: <i>[Signature]</i>	Date: <i>7/9/23</i>
Test Signature: <i>[Signature]</i>	Date: <i>4/9/23</i>

7: ASSEMBLY AND TEST RECORD

Client:	The Ohio State University		
Quotation Number:	16671	Date:	17/04/2023
Job Number:	IN1316	Date:	15/05/2023

PRODUCT:

Integra 2

SERIAL NUMBER:

20802/4-2023/1316

 ASSEMBLED:
 (Name)

P. Hays

Date:

4
16/8/23

 PRE-TEST
 INSPECTION:
 (Production name)

P. Hays

Date:

4/8/23

 PRE-TEST
 INSPECTION:
 (Test name)

S. Maset

Date:

4/8/23

 SYSTEM TEST:
 (Name)

S. Maset

Date:

4/9/23

 PRE-DESPATCH
 INSPECTION:
 (Name)

S. Maset

Date:

6/9/23

P.A.T. Test results

 In compliance with Low Voltage directive 73/23/EEC
 To Low Voltage standard EN61010 – 1:1993

Earth Continuity

0.096
 Ω

Insulation

>300
 $M\Omega$

Earth Leakage Current

0.05 0.25

mA. @

0.05

kVA.

Tested by:

Oliver Wright

Date:

4/8/23

8 - Serial Numbers Record Document

Client:	The Ohio State University		
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Units	S/N
MS/ABCA	
Integra 2	20802/4-2023/1316
Prep Unit 1	
Prep Unit 2/Misc	
Electronics Upgrade	
CETAC	
Gas Box	
Autosampler	42678
BCR	
Dual Heater Block	

Pump Kit and Optics	S/N
Turbo pump S	1T23216043
Turbo pump A	
Rotary Pump	230225502
Voltage	110 / 240
Gauge S	L12310F223
Gauge A	
Source	20101-222
Collector 1	20301-142
Collector 2	
Magnet	18-7-238

Parts	S/N
Fan PSU	
24V PSU	

PCBs	S/N
Electronics Box	20230018
Prep PCB	
VFC PCB	
Watchdog PCB	
Head Amp PCB 1	23017
Head Amp PCB 2	
Electromagnet RP	

Furnaces	S/N
Combustion	
Reduction	
HT-EA	
GC Oven	
Furnace 1	
Furnace 2	

PC	S/N
PC	J3M1603
Monitor	9K581P3
Printer	

Key

Pumps:	E: Edwards
	P: Pfeiffer
Furnaces:	V/S: Vecstar
	E: Elite
Magnet:	E: Electromagnet
	S: Standard
Turbos & Gauges:	S: Source
	A: Analyser
Collectors:	Std: Standard
	S: Sulphur
	HD: Hydrogen Deuterium

Additional System Info:

11 – Installation Report

Client:	The Ohio State University		
Quotation Number:	16671	Date:	17/04/2023
Job Number:	IN1316	Date:	15/05/2023

Contact:	Kyle Sklenka		
Date of Visit:	8 th – 12 th of January 2024	No. of Days:	5
Engineer:	David Harris		

Details of visit:

Arrived on site – Instruments still in delivery boxes. No sign of damage to boxes.
Customer had old MS instruments set-up on desk to where the INTEGRA2 would be located. These instruments are to be part of an exchange deal with Sercon.

Customer & engineer removed old instruments from desktop – All OK
Positioned new INTEGRA2 on desktop – All OK
No damaged noted to system – All OK.
Unit powers on OK, all fans respond. No issues seen – All OK
Installed PC and established comms. – All OK.
Callisto is set up as standard. All valves respond – All OK
New cylinders brought into room by customer, backline plumbing fitted, and leak checked – All OK.
Customer is using old copper 1/8th tubing taken from the previous instrument. Line is clean – All OK.

Demonstrated how to add oil to rotary pump and fit to INTEGRA2 – All OK
Pumps respond OK, no issues seen. System is fitted with a single Agilent Turbo pump and pumps down at a speed comparable to similar Sercon systems. By day 5 a backing vacuum of 3.7e-08mBar was observed. – All OK. Background scans over the week show CO₂, O₂, and N₂ trace levels decreasing over time – All OK. Advised that the oil should be change at least once a year to keep system in good working order.

Demonstrated to users how to make up tubes for system and fit correctly.
Fitted combustion & reduction tubes. Fitted CO₂ scrubber and water trap tubes – All OK.
Established flows and adjusted crimps as required. Flow approx. 65ml/min – All OK.
Calibrated flow meter – All OK.
Flow and pressure readbacks respond as expected – All OK.
Leak checked system – pass.
Demonstrated to customer how to heat up furnaces in controlled manner of 200°C jumps. Furnaces & GC oven all respond with no issues – All OK
Temp temps up for combustion configuration (Combustion = 1000°C, Reduction = 600°C)
Set GC oven to 140°C to bake out column over night. Set to 60°C for combustion analysis.

Fitted magnet – All OK. Tuned instrument from trapped AS Beet mix samples – All OK.
Demonstrated to customer tuning controls. Explained and demonstrated daily check to users (HT position check, peak shape scans and stability scans).

Flash combustion good on samples. Methods all OK.
Explained method set-up to users (control for events, acquisition timing changes, reference files building, etc)
Demonstrated to users how to build sample lists and run batches.

Ran installation specs on AS Beet Mix samples.
Dual Precision batch = N100ug, C400ug.
Dual Linearity range = N10-200ug, C25-500
All combustion specs pass – All OK. See below for results.

11 – Installation Report

Client:	The Ohio State University		
Quotation Number:	16671	Date:	17/04/2023
Job Number:	IN1316	Date:	15/05/2023

Cooled off furnaces and GC oven to convert over to pyrolysis mode.
 Removed combustion tube. Fitted pyro tube. Adjusted plumbing as required to bypass 2nd furnace - All OK.
 Set 1st furnace to 1050°C for low temp pyrolysis analysis – All OK.
 Removed N&C GC column (N₂ & CO₂) and replaced with oxygen column (N₂ & CO separation).
 Oxygen GC column does not fit in GC oven. Wrong shaped column sent to customer; the size is for the standard larger GC oven.
 Engineer reshaped GC column to fit inside, however it was not an easy task to reshape the tubing. As a result, GC column does not now look perfectly shaped. Testing the column shows that the GC column functions correctly, however if the user is not satisfied a different shaped GC column can be requested from Sercon.
 Baked out Oxygen Column over night at 140°C. Set to 80°C for analysis – All OK.
 Set up Pyrolysis method within software. Trapped CO using sucrose sample – All OK.
 Tuned CO 3/1 peak shape for ¹⁸O analysis, checked stability – All OK.
 Weight sucrose samples for testing.

Initial samples batch showed some drift occurring on the chromatography. Adjusted fittings, no leaks detected.
 Set up method for conditioning pyro tubes. Chromatography stabilised out after tube conditioning.
 Results for batch sample good for low temp pyrolysis. Precision tested on 0.4mg sucrose samples in silver caps. See below for results.

Combustion mode:

CO ₂ (2/1) Peak Shape = OK	AS Beet Mix ¹³ C Precision = 0.012‰ S.D.
CO ₂ (2/1) Stability = OK	AS Beet Mix ¹³ C Linearity = 0.105‰ S.D.
N ₂ (2/1) Peak Shape = OK	AS Beet Mix ¹⁵ N Precision = 0.072‰ S.D.
N ₂ (2/1) Stability = OK	AS Beet Mix ¹⁵ N Linearity = 0.056‰ S.D.

Pyrolysis mode:

CO (2/1) Peak Shape = OK	Sucrose ¹⁸ O Precision = 0.270‰ S.D.
CO (3/1) Stability = OK	

Members of the department visited for training purposes. Explained system and the processes involved. Demonstrated software, daily checks, methods, sample list building (Test/Ref, drift correction, where to find the results, etc).
 Explained preventative maintenance advisories, (change filament every year, change oil in rotary pump at least once per year, etc).
 Demonstrated use of the Reprocessor software. Showed how to alter timing windows and edit sample lists.

Converted system back over to combustion set-up at the request of customer.
 Made up new combustion tube and fitted with user. – All OK.
 Checked over system. All looks OK.
 Install complete.

11 – Installation Report

Client:	The Ohio State University		
Quotation Number:	16671	Date:	17/04/2023
Job Number:	IN1316	Date:	15/05/2023

Recommendations:	
N/A	
Faults and Shortages:	
N/A	
Follow up:	
N/A	
Engineer:	David Harris
Date:	12 th January 2024
Signed:	

12 – Installation Acceptance and Warranty Certificate

Client:	The Ohio State University		
Quotation Number:	16671	Date:	17/04/2023
Job Number:	IN1316	Date:	15/05/2023

Contact:	Kyle Sklenka
System:	INTEGRA2 (with Low Temp Pyrolysis upgrade kit)
Software:	Callisto v40.7.1
Engineer:	David Harris
Installation Date:	12th January 2024

Warranty commences:	12 th January 2024
Warranty Expires:	12 th January 2026

Customer Acceptance:

Name: Kyle Sklenka

Signature: *Kyle Sklenka*

Date: 12 Jan 2024

Engineer's Signature:

On behalf of Sercon Limited

Name: David Harris

Signature: *[Signature]*

Date: 12th January 2024

Notes:
N/A