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Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

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ADDITIONAL:

Payment Terms:

50% / 40% / 10%

Other: please specify

Penalty Clause

Yes

No

Please specify:

Blue Book Completion:

Signed		Date	21.08.26
Verified		Date	21.08.26

Quotation

To: Taiyo Nippon Sanso Corporation
Minato Mirai Grand Central Tower 7F
4-6-2, Minatomirai,
Nishi-ku, Yokohama,
Kanagawa 220-8561,
JAPAN

VAT Reg No: JP

Quotation Date: 29/08/2025
Quotation Reference: 19214
Customer Ref: Prof. Yousuke Yamada
Tohoku uni
NIP001
Account Ref.
Quotation Validity: 28/02/2026

Quantity	Product Code	Product Description	Unit Price £	Net Price £
Agent Pricing				
1	20402/4	HS2022 + Hd Collector + E-Mag + Trap Loop Continuous flow isotope ratio mass spectrometer. Including high sensitivity source, electro magnet and HD collector Innovative trapping loop technology included, which allows the source to be tuned and delta values to be calculated without the need for a reference gas. System configured for m/z 28 to 64 for the analysis of H2, CO2, N2, N2O, NO, O2, SO, SO2, CO and CH4 (converted to CO2). Windows based data system. 70201-1 - Analyser spares kit includes a filament, copper gaskets, source tool kit, pump oil, snoop and ferrules	84,350.000	84,350.00
1	10202/13	iso-Earth+ High performance elemental analyser including TCD for simultaneous CNS analysis. Includes autosampler for solids. 70501-3 - Includes sample preparation kit - micro spatula, mirror, forceps, sample tray and syringe 70501-5 - Includes start up consumables kit for simultaneous CNS analysis	37,898.000	37,898.00
1	11501/7	HT-EA (Without Autosampler) For high temperature pyrolysis for H & O. Additional autosampler required for liquid injections. 70801-1 - Pyrolysis start up kit high temp for solids. 71501-1 - HT-EA Pyrolysis start up kit O and H (Used In Build)	17,850.000	17,850.00
1	70501-14	Liquid Sampler Option (HTA) Includes - 71501-3 HT-EA Sensitivity Start Up Kit for O & H in small samples	12,000.000	12,000.00
1	10302	Aqua Unit 71801-2 - Aqua start up kit inc.	9,000.000	9,000.00

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Customer Ref: Prof. Yousuke Yamada

Account Ref: Tohoku uni
NIP001

Quotation Validity: 28/02/2026

Quantity	Product Code	Product Description	Unit Price £	Net Price £
1	60101/4	verSA 4 (Cryoprep No Plumbing)	11,379.640	11,379.64
5	SI1770	ABCA2 CTAC Tube Racks	531.100	2,655.50
1	SI3089	Base Locator ABCA	542.000	542.00
2	SC8500A	12ml 15.5x101mm Breath Sampling Vial. Blue Open Top Screw Cap with Butyl Septa, pk/100 Flat Bottom. Non Coated Vial. Non Evacuated. Vial+Cap+Septa are pre-assembled together. Kit Packing 100pcs/pk	35.000	70.00
1	DAP	DELIVERED AT PLACE Excluding any local duties and taxes that may apply.	4,000.000	4,000.00
1	INST	Installation support from factory	7,750.000	7,750.00
1	WARR2	2 year warranty		
		Less Discount of £7,202 For Heater Block / Aqua System		
	DISCOUNT	Otsuka system		-7,202.00

* The price quoted does not include any local taxes or duties
 See separate document for terms and conditions

This quotation is issued in **Pound Sterling**

Total Net Amount £ 180,293.14

Total VAT Amount £ 0.00

Order Total £ 180,293.14

Payment Details:-

100% Net 30 days.

Payment is required within 30 DAYS of invoice date by bank transfer.
 All bank transfer charges are the responsibility of the customer.

Sercon Bank Details:-

National Westminster Bank, 36 High Street,
 Nantwich, Cheshire CW5 5GA U.K.

IBAN: GB74NWBK54101736755133

SWIFT/BIC: NWBKGB2LXXX

PURCHASE ORDER
No. SC-105-009



TAIYO NIPPON SAN SO
The Gas Professionals

Stable Isotope Sect.

4-6-2Minatomirai

Nishi-ku Yokohama, Kanagawa, JAPAN

TEL: +81-4-5872-1823 / FAX: +81-4-5872-1825

DATE: 21, January, 2026

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ATT:

SERCON LIMITED
Europa House, Coppicemere
Drive, Crewe, CW1 6GZ UK

WE AS BUYER CONFIRM TO BUY AS SELLER THE FOLLOWING GOODS ON THE TERMS AND CONDITIONS AS STATED BELOW:

PAYMENT NET 30

SHIPPING MARK: TO BE INDICATED OUR P/O # ON ALL DOCUMENTS & CONTAINER

No	DESCRIPTION	QUANTITY	UNIT PRICE	AMOUNT
01	PRODUCT # 20402/4 HS2022 + Hd Collector + E-Mag + Trap Loop etc. for Tohoku univ. CONTAINER:	1×1 set	@ 180,293.14	GBP 180,293.14
NOTE : CUSTOMER :TOHOKU UNIV.		SHIPMENT 29-May-2026		
		DESTINATION NARITA		
SHOW THE ORDER NUMBER ON ALL : INVOICE,PACKING SLIP,AIRWAY BILLS,OTHER CERTIFICATION (ANALYSIS)		REFERENCE QUOTATION #19214		
		Our Management # 105-03057-002		
		(P. 0# SC-105-009-001)		

Details are as attached Quotation 19214f.

PLEASE SIGN
AND RETURN THE DUPLICATE
SELLER

BUYER

g. Murakami

星野 誠

Mayumi Hori

Mayumi Hori

3 - MACHINE SPECIFICATION

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
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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+	✓
10202/25	PyroEArth	
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.)	
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)	
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	
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	

Ref No.	Product Description	Required
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S027_v12

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17/10/2025

*** When ordered alone IN no. / Blue book NOT required

3 - MACHINE SPECIFICATION

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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 (<i>Inc. With ABCA2</i>)		
70101-2	ABCA2 Spares Kit for AB Analitica 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		
70201-2	Integra2 analyser spares kit - Included		
70401-1	Integra-2 consumables (<i>Inc. With Integra2</i>)		
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 & 18O)		
21802/1	GEO 20-22		
21802/2	GEO 20-22 + E-Mag		
21802/3	GEO 20-22 + E-Mag +Hd		
21802/4	GEO 20-22 Inlet		

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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	
Printer	Printer	
INST1	Installation and start up training at customer's site by Sercon Engineer	
INST2	Installation and start up training at customer's site by Agents Engineer	
WARR	1 year warranty	
WARR2	2 year warranty	
TRAIN	Training in UK for one person for 3 days	
SCONTRACT	Maintenance Service Contract – 1 year	
SPECIFICATION REQUIREMENTS		
Voltage	Volts 50/60Hzs	

3 - MACHINE SPECIFICATION

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Plug Type	SI2510	3 Metre USA/Japan plug to IEC C 13	✓
	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		
	Complies with all Export Requirements		

4 - LOG SHEET

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Date	Action Taken	By Whom
11/2/26	Mass Spec Set up and pumping down	AD
12/2/26	Vacuum good. Filament conditioned ok Crimps and flows set.	AD
13/2/26	Good magnet position for CO ₂ and N ₂ found CO ₂ + N ₂ Specs pass leaving in HD mode over weekend	AD
16/2/26	Magnet moved for HD. HD Specs pass Retuned for N ₂ analysis	AD
17/2/26	CO ₂ and N ₂ pass Specs. System being used to test IN1377 isochron	AD
2/3/26	Aqua unit connected to PC. Crimps for He line set, flow measured at end. Versa power cable had wrong attachment. Flow meter had metal ferrules GC heats up	AD
3/3/26	Versa Set up Equilibration gas crimp set Versa X axis block incorrect - Swapping for correct one	AD
4/3/26	Versa co-ords reconfigured CO ₂ gas analysis pass specs	AD
5/3/26	HD gas analysis pass Specs. Running water analysis (HD), leaving to equilibrate for 10 hours	

4 - LOG SHEET

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
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Date	Action Taken	By Whom
6/3/26	Waited Equilibrations for HD passes using 6ml vials 12ml vials tried (gave around a 3.0 std dev)	AD
9/3/26	Agua shut down	
10/3/26	Starting to set up HT-FA. Top plate needs modifying to sit liquid sampler. No liquid injector parts - on wait. liquid sampler connected and working. Top plate modified - liquid sampler now secured	AD
12/3/26	Isocath on test - connected to pc. He connected - leaking after valve 6. Crimps set for He flow	AD
23/3/26	Full flow through unit connected to MS, trapping loop crimped down. Flow sensors calibrated. Tubes in furnace - heating	AD
24/3/26	Pressure test passes. Furnaces at temperature. N2 background low E^{-11} , blanks low $2.3E^{-10}$	AD
25/3/26	SO2 tuned. Test sample dropped and windows adjusted. TCD cal controller set and heated to 125°C	
26/3/26	Autosampler stopped turning - adding new arm mod.	



4 - LOG SHEET

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
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Date	Action Taken	By Whom
27/3/26	N ₂ results all over the place - retuned ref gas passes precision and linearity - leaving beet mix run over weekend	AD
30/3/26	Last batch results still had bad N ₂ C and S really good. mock the flow to prep iso valve - run on	AD
31/3/26	missed sample in overnight batch - but delta's and 2/1 look better. Another batch ran - closer to spec but a couple fly away samples. He detected at valve T where prep iso is connected - tightened up. will run a batch to see if this helps.	AD
1/4/26	N ₂ now passes but delta's need improving. blanked off prep iso → valve N ₂ results more consistent but still slightly out - replaced valve. Running batch overnight	AD
7/4/26	Vacuum not reaching less than 2×10^{-7} . Blanked off all iso valves - no change. blanked off 1 st valve T - no change. Blanked off source flange. Slow to pump down. Baked all flight tube.	
8/4/26	Vacuum low 10^{-7} . Checked gauge - reading is real. Put all 6 therm boxes in - vacuum still not in -8's. Leaving in N ₂ mode to internally bake	AD
9/4/26	No improvement, pulling source. Source looks ok, used a blank flange	AD

4 - LOG SHEET

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Date	Action Taken	By Whom
9/4/26	Stripped gauge flange and pad for new vacuum reacted mid E ^{8s} Putting source back in	AD
10/4/26	Vacuum in E ^{9s} - Gauge flange cause of issue. Putting line back in source. Vacuum got to E ^{8s} filament back on - back in low E ^{7s} letting settle All ok now	AD
23/4/25	Isolation valve added to H5202. Isocath still not passing N ₂ Specs. Blockage to flow in combustion furnace	HL
27/4/25	Combustion tube split - removing furnace to get it out. New tubes and water trap. Full flow back in system	AD
28/4/25	Heating furnaces	AD
30/4/25	Swapped furnace bottom fittings and flushed the lines. Specs looking ok. TCD tested - ok HT-EA Connected to PC and Abus Set.	
1/5/25	HTA Set up with alignments and methods. Trigger cubic works furnace heating	
04 May 26	No sample peaks present. Adjusted AS setup → Peaks now present	DJH

4 - LOG SHEET

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05/04/26	Results good for CO (17O) analysis	DH
06/05/26	Results good for HD analysis	DH



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S029 v3



5 - FAULT REPORTING

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
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[illegible]



5 - FAULT REPORTING

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
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[illegible]



Sercon Ltd, Europa House, Coppicemere Drive,
Crewe, Cheshire CW1 6GZ, UK
Tel: +44 (0)1270 580008
Company Registration No. 4290072 Vat No. 771 1100 74

5 - FAULT REPORTING

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
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[illegible]

5 - FAULT REPORTING

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
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6 - TEST / ACCEPTANCE SPECIFICATION

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HS20-22

Reference Gas Precision (n=5) x5 Ref gas pulses of 5 seconds to be used.

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 ref gas pulses ranging from 1-second trough to 10 seconds

¹³ C	≤0.02‰/nA STD Deviation <0.30	
¹⁵ N	≤0.02‰/nA STD Deviation <0.30	

IsoEarth & PyroEarth

Combustion (n=5) (For NCS use 0.3mg of Cystine) (Pyrolysis use silver caps) 0.4mg of Cystine for ¹⁸O and 4 mg of Cystine for H₂

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	
¹⁸ O	100 µg or 1 µl water	0.3				
² H	200 µg H or 1 µl water	1.0				

6 - TEST / ACCEPTANCE SPECIFICATION

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EArth			
Solid specs to be completed using 2mg methionine calibration against 1,2,3mg (n=3) cystine. Combustion (n=5)			
		Accuracy (avg)	Precision (std dev)
¹³ C		+/- 0.4%	0.2
¹⁵ N		+/- 0.4%	0.2
² H		+/- 0.4%	0.2
³⁴ S		+/- 0.4%	0.2
¹⁸ O	Pyrolysis	+/- 0.4%	0.2
Liquid injections n=5 using 5µl methanol calibrated against 2,4,6µl injections of ethanol			
		Accuracy (avg)	Precision (std dev)
¹⁸ O	Pyrolysis	+/- 0.4%	0.2

Integra2			
Specs to be completed using AS beet mix 400C/100N for precision & 250C/100N for linearity			
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	
Dual	100 µg N & 250 µg C	0.5	
HT-EA (Pyrolysis use silver caps) 0.4mg of Cystine for ¹⁸ O and 4 mg of Cystine for H2			
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	

6 - TEST / ACCEPTANCE SPECIFICATION

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Aqua, μ Carbs & GasBox					
Equilibrations (n=5)					
^{18}O	0.2 ml water	0.1			
^2H	0.2 ml water	2.0	2.0 (no headspace blank)		✓
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	0.03	✓	Air CO_2 0.1
^{18}O	5% CO_2	0.1	0.06	✓	Air CO_2 0.2
^2H	0.5 ml H_2	1.5	1.1	✓	
^{15}N	0.5 ml N_2	0.1			100 ppm N_2O 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			

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

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

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			0.759% s.d		✓
¹⁸ O	0.1 µl water	0.4			0.087% s.d		✓

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						

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)							

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

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	

Special tests

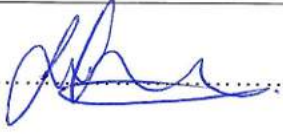


Sercon Ltd, Europa House, Coppicemere Drive,
Crewe, Cheshire CW1 6GZ, UK
Tel: +44 (0)1270 580008
Company Registration No. 4290072 Vat No. 771 1100 74

Test acceptance - 6

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Sales Signature: 	Date: 21/01/26
Test Signature: 	Date: 21/01/26

7: ASSEMBLY AND TEST RECORD

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

PRODUCT:

HS2022

SERIAL NUMBER:

20402/4-2026/1377

 ASSEMBLED:
 (Name)



Date:

02/02/26

 PRE-TEST
 INSPECTION:
 (Production name)



Date:

02/02/26

 PRE-TEST
 INSPECTION:
 (Test name)



Date:

02/02/26

 SYSTEM TEST:
 (Name)



Date:

12/05/26

 PRE-DESPATCH
 INSPECTION:
 (Name)



Date:

14/5/26

P.A.T. Test results

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

Earth Continuity

0.070
 Ω

Insulation

> 300
 $M\Omega$

Earth Leakage Current

2.35

mA. @

0.9

kVA.

Tested by:



Date:

02/02/26

**sercon**

Date: 02/02/26

Production Handover Checklist

Unit Name	HIS2022
Product Code	20402/4
Customer	Tohoku uni (TNS)
Unit IN/Stock Number	Stock 22

Visual Inspection

REF	Description	Initial
V1)	All external cover/Panels present	H12
V2)	Cabinet and panels free from dents/scratches/damage	H12
V3)	Doors and panels fitted right and correctly alignment	H12
V4)	All instrument controls/fuse holders/connections all marked according to the schematic	H12
V5)	Sercon Logo/Vinyls fitted correctly to door and panels	
V6)	Unit rating/serial sticker correct and fitted to fixed rear panel	TBF
V7)	Mains isolation sticker fitted to all removable panels	H12
V8)	internal compartments free from dust and debris	H12

Mechanical Inspection

REF	Description	Initial
M1)	All fastenings fitted correctly I.E Flat washers and shakeproof washer ETC	H12
M2)	All fastenings tight and tightened to the correct torque where applicable	H12
M3)	All cooling fans fitted correctly with air flow in the right direction and guards present	H12
M4)	All plumbing bulkheads and fittings fitted correctly and tightend to required torque	H12
M5)	All piping secure and free from kinks ETC	H12
M6)	All Valves/Pipework/Fittings labelled correctly	H12

Electrical Inspection

REF	Description	Initial
E1)	Equipotential earth bonding to all removable panels	TBF
E2)	All cable terminations tight and correctly crimped	H12
E3)	All Cable identifications and sizes correct to the schematic drawing	H12
E4)	Ribbon cables fitted and "Checked" label applied	H12
E5)	All fuses fitted to holders and are correct rating as schematic drawing	H12
E6)	All instrument cables supplied with unit	

Testing

REF	Description	Initial
T1)	Use 24V test power supply to run and check correct operation of the unit cooling fans	H12
T2)	P.A.T unit	H12
T3)	P.A.T Sticker filled in and applied to the rear of unit	TBF
T4)	P.A.T results logged in the blue book	H12

Works Order Picking List

Stock 22.

Date: 09/01/2026

Time: 13:04:01

Works Order: WO02595
Stock Code: 20402/4
Description: HS2022 + Hd Collector + E-Mag + Trc
Qty Required: 1.00 Each
Qty Outstanding: 1.00
Plan Period: WK2/2026
Due Date: 05/03/2026

Picked Items
Issued 12/1/25
-SS. Pump
KIT
10/12/25

<u>Stock Code / Description</u>	<u>Qty to Pick</u>	<u>Unit</u>	<u>Location</u>	<u>Qty Picked / By</u>
Manufacturing Instructions: Stock				
9099/1 Instrument Packing	1.00	Each		
SI1754 Emag Drive Panel with Cable	1.00	Each	✓	
70101/11 20-22 Head Amp Inverter PCB Cable	1.00	Each	B-H1 ✓	
70101/13 Standard Head Amp Cable	1.00	Each	B-H1 ✓	
SI2579 20-22 Cabinet Wave Assy Rev 004	1.00	Each	C1	
SI2614 HS2022 Artwork	1.00	Each	C1	
SI1052 3 Way MOLEX Clip	1.00	Each	Carousel 1 M-1 ✓ 1	
SI1255 M5 Plug	2.00	Each	Carousel 1 M-1 ✓ 2	
SI1548 4A Fuse, Anti Surge 5x20mm	1.00	Each	Carousel 1 M-1 ✓ 1	
SI2285 Mag Terminal Cover Black	4.00	Each	Carousel 1 M-3 ✓ 4	
SI0687 1/8" PTFE Ferrules - Blank	1.00	Each	Carousel 1 P-1 ✓ 1	
SI0701 1/4" PTFE Ferrules Pk/1	2.00	Each	Carousel 1 P-1 ✓ 2	
SI0710 VALCO Tee - 1/16	2.00	Each	Carousel 1 P-1 ✓ 2	
SI1900 Dowty Seal - M5	20.00	Each	Carousel 1 P-1 ✓ 20	
SI1244 Seal Kit	1.00	Each	Carousel 1 P-2 ✓ 1	
SI1595 37 Way D Plate	3.00	Each	Carousel 1 P-2 ✓ 3	

Works Order Picking List

Date: 09/01/2026

Time: 13:04:01

Works Order: WO02595
Stock Code: 20402/4
Description: HS2022 + Hd Collector + E-Mag + Trc
Qty Required: 1.00 Each
Qty Outstanding: 1.00
Plan Period: WK2/2026
Due Date: 05/03/2026

<u>Stock Code / Description</u>	<u>Qty to Pick</u>	<u>Unit</u>	<u>Location</u>	<u>Qty Picked / By</u>
SI0703 1/8-1/16" PTFE Reducing Ferrule Pk/1	7.00	Each	Carousel 1 P-3	✓ 7
SI0196 Reducing Union 1/4 x 1/16 SS	2.00	Each	Carousel 1 Q-1	✓ 2
SI0197 Reducing Union 3/16 OD x 1/16 OD SS	2.00	Each	Carousel 1 Q-1	✓ 2
SI0762 PSR16-16 PTFE Sealing Rings Pk/20	0.60	Each	Carousel 1 Q-1	✓ .6
SI0022 Capillary Crimp Parts A & B	7.00	Each	Carousel 1 Q-2	✓ 7
SI0198 Tee Union 1/16 SS	1.00	Each	Carousel 1 Q-2	✓ 1
SI0204 Bulkhead Union 1/16 SS	2.00	Each	Carousel 1 Q-2	✓ 2
SI0205 Bulkhead Union 1/8 SS	5.00	Each	Carousel 1 Q-2	✓ 5
SI0049 Big Magnet Adjusting Foot	1.00	Each	Carousel 1 Q-3	✓ 1
SI0050 Magnet Foot	2.00	Each	Carousel 1 Q-3	✓ 2
SI1812 E-Mag Screw	3.00	Each	Carousel 1 Q-3	✓ 3
SI1899 1/16 x M5 Fitting	18.00	Each	Carousel 1 Q-3	✓ 18
SI3133 3/16 OD X M5-0.8 MALE CONNECTOR SS	2.00	Each	Carousel 1 Q-3	✓ 2
SI1196 Female NiPt D screwlock assembly, 8mm	6.00	Each	Carousel A-1	✓ 6
SI1482 34 Way IDC Bump Polarised Socket, 1A	1.00	Each	Carousel A-3	✓ 1
SI0086 Ref Gas Bracket Mounting Bracket slot	5.00	Each	Carousel B-1	✓ 5
SI0794 Female NiPt D Screwlock assembly, 13mm	2.00	Each	Carousel B-1	✓ 2

Works Order Picking List

Date: 09/01/2026

Time: 13:04:01

Works Order: WO02595
Stock Code: 20402/4
Description: HS2022 + Hd Collector + E-Mag + Tr
Qty Required: 1.00 Each
Qty Outstanding: 1.00
Plan Period: WK2/2026
Due Date: 05/03/2026

<u>Stock Code / Description</u>	<u>Qty to Pick</u>	<u>Unit</u>	<u>Location</u>	<u>Qty Picked / By</u>
SI1004 Right-Angled Bracket 25mm	2.00	Each	Carousel B-1	✓ 2
SI0631 9 Way D Hood	2.00	Each	Carousel B-3	✓ 2
SI0632 15 Way D Hood	2.00	Each	Carousel B-3	✓
SI0900 25 Way D Hood	1.00	Each	Carousel B-3	✓
SI0524 3 Way Socket Housing, 2.54mm Pitch	1.00	Each	Carousel C-1	✓
SI0777 Nylon Pillars Male-Female M4x25mm	4.00	Each	Carousel C-1	✓
SI0385 25 Way Machine Cont Straight D Skt, 750Vac	1.00	Each	Carousel D-3	✓
SI0387 9 Way Machine Cont Straight D Plug, 750Vac	1.00	Each	Carousel D-3	✓
SI0388 9 Way Machine Cont Straight D Skt, 750Vac	1.00	Each	Carousel D-3	✓
SI0570 15 way Solder Contact ZD skt 5A 400 Vac	3.00	Each	Carousel D-3	✓
SI1794 37 Way IDC D Socket - Metal	1.00	Each	Carousel D-3	✓
SI1795 37 Way IDC D Plug - Metal	2.00	Each	Carousel D-3	✓
SI1580 Source Mounting Pillar	2.00	Each	D-U2	✓
SI3271 Straight IEC C13 Socket to Straight IEC C14	1.00	Each	Stores A-1	✓ 1
SI0847 IEC Cord - Socket	2.00	Each	Stores A-2	✓ 2
SI0374 Terminal Block Section	8.00	Each	Stores A-3	✓ 8
SI0375 Terminal Block End Plate	2.00	Each	Stores A-3	✓ 2

Works Order Picking List

Date: 09/01/2026

Time: 13:04:01

Works Order: WO02595
Stock Code: 20402/4
Description: HS2022 + Hd Collector + E-Mag + Trz
Qty Required: 1.00 Each
Qty Outstanding: 1.00
Plan Period: WK2/2026
Due Date: 05/03/2026

<u>Stock Code / Description</u>	<u>Qty to Pick</u>	<u>Unit</u>	<u>Location</u>	<u>Qty Picked / By</u>
SI2631 End Bracket	2.00	Each	Stores A-3	✓ 2
SI0620 IEC Insulated Cover	1.00	Each	Stores A-4	✓ 1
SI0903 I.E.C Socket Mount	1.00	Each	Stores A-4	✓ 1
SI1328 Mains Filter	1.00	Each	Stores A-4	✓ 1
SI1491 IEC Insulation Cover	1.00	Each	Stores A-4	✓ 1
SI1344 IEC Connector Clamp Kit	2.00	Each	Stores A-5	✓ 2
SI1797 Fuse Holder Insulation Cover	2.00	Each	Stores A-5	✓ 2
SI2304 Screwdriver bayonetcap fuseholder 5x20mm	2.00	Each	Stores A-5	✓ 2
SI0630 80mm Fan Guard	6.00	Each	Stores A-6	✓ 6
SI0793 80mm DC Fan	6.00	Each	Stores A-6	✓ 6
SI1418 80mm Fan Screen Filter	6.00	Each	Stores A-6	✓ 6
SI3126 Traco Power 24volt PSU	1.00	Each	Stores A-7	✓ 1
SI0373 34 Way IDC Terminal Block	1.00	Each	Stores A-8	✓ 1
SI0508 24V PSU - Add Finger Cover	1.00	Each	Stores A-8	✓ 1
SI0534 3307 Telescopic Slide 457mm L 483mm	1.00	Each	Stores A-8	✓ 1
SI1236 Levelling Foot - M10x38mm	5.00	Each	Stores A-8	- 5 (on unit)
SI0112 NW10/16 Clamping Ring Stainless Steel - Edwards	1.00	Each	Stores B-1	✓ 1
SI0113 NW10/16 Adapt/Cent Viton® SS - Edwards	1.00	Each	Stores B-1	✓ 1

Works Order Picking List

Date: 09/01/2026

Time: 13:04:01

Works Order: WO02595
Stock Code: 20402/4
Description: HS2022 + Hd Collector + E-Mag + Tr
Qty Required: 1.00 Each
Qty Outstanding: 1.00
Plan Period: WK2/2026
Due Date: 05/03/2026

<u>Stock Code / Description</u>	<u>Qty to Pick</u>	<u>Unit</u>	<u>Location</u>	<u>Qty Picked / By</u>
SI2289 Oil Mist Eliminator **requires SI2294**	1.00	Each	Stores B-1	✓ 1
SI2294 NW10 x 3/8" Bsp Adapter	1.00	Each	Stores B-1	✓ 1
SI0346 SPDT plug-in power Relay - 10A 24V DC coil	3.00	Each	Stores B-2	✓ 3
SI0347 SPCO Relay Base	3.00	Each	Stores B-2	✓ 3
SI0355 DPCO Plug-in Relay, 10A 24V DC coil	1.00	Each	Stores B-2	✓ 1
SI0376 DPCO Relay Base	1.00	Each	Stores B-2	✓ 1
SI0344 2P red illuminated round rocker switch, 10A	4.00	Each	Stores B-5	✓ 4
SI2411 KVT 20 Split Cable Gland (inc locknut)	1.00	Each	Stores B-6	✓ 1
SI2412 KT 5 insert	1.00	Each	Stores B-6	✓ 1
SI1247 4-Station Manifold - M5	1.00	Each	Stores B-8	✓ 1
SI1481 4 WAY REF GAS MANIFOLD	1.00	Each	Stores B-8	✓ 1
SI0366 Flow Meter PMFc3100V	1.00	Each	Stores D-2	✓ 1
SI2296 Precision Flow Control	1.00	Each	Stores D-2	✓ 1
SI1241 3 Way Solenoid Valve	2.00	Each	Stores D-3	✓ 2
SI1245 SOL Cable	7.00	Each	Stores D-3	✓ 7
SI1821 3 Port valve	7.00	Each	Stores D-3	✓ 7
SI0697 MOVPT-S-1-50 Pneumatic Valve (EF3240-R1-001)	4.00	Each	Stores D-4	✓ 4

7: ASSEMBLY AND TEST RECORD

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

PRODUCT:

MTEA

SERIAL NUMBER:

115017-2025/1377

ASSEMBLED:

(Name)



Date:

13/10/25

 PRE-TEST
 INSPECTION:

(Production name)



Date:

13/10/25

 PRE-TEST
 INSPECTION:

(Test name)



Date:

03/02/26

SYSTEM TEST:

(Name)



Date:

12/05/26

 PRE-DESPATCH
 INSPECTION:

(Name)



Date:

14/05/26

P.A.T. Test results

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

Earth Continuity

0.05
 Ω

Insulation

>300
 $M\Omega$

Earth Leakage Current

0.75

mA. @

0.20

kVA.

Tested by:



Date:

13/10/25-26



Date:

Production to Test Handover Checklist.

HTEA

Unit Name	HTEA
Product Code	
Unit IN Number	
Customer	

Stores Checks when kitting before build.

Please Highlight Correct Box

Unit Voltage	110v	240v	
Unit Ampage	13amps	16amps	
Solid or Liquid Sampler or both	Liquid	Solid	Both
Sticker Requirements	Sercon	Labtech	

Production engineer check before starting to build.

Please initial

blue book checks	Production Engineer sign off.
You have the blue book	
page 3 machine specifications is signed	
page 7 assembly and test record sheet filled in	
page 7 PAT test results recorded	
page 8 serial numbers record document filled in	
correct drawing are included and stamped in blue book	MR.
units works order is with the assembly and test record	MR.

7: ASSEMBLY AND TEST RECORD

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

PRODUCT:

Aqua System (10302/1)

SERIAL NUMBER:

10302/1-2026/1377

 ASSEMBLED:
 (Name)



Date:

05/02/2026

 PRE-TEST
 INSPECTION:
 (Production name)



Date:

05/02/2026

 PRE-TEST
 INSPECTION:
 (Test name)



Date:

05/02/2026

 SYSTEM TEST:
 (Name)



Date:

09/03/2026

 PRE-DESPATCH
 INSPECTION:
 (Name)



Date:

14/05/2026

P.A.T. Test results

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

Earth Continuity

0.088
 Ω

Insulation

>300
 $M\Omega$

Earth Leakage Current

0.25

mA. @

0.5

kVA.

Tested by:



Date:

09/02/2026

**sercon**

Date: 5/02/1377

Production Handover Checklist

Unit Name	Aqua System
Product Code	10302/1
Customer	Tohoku University
Unit IN/Stock Number	IN/377

Visual Inspection

REF	Description	Initial
V1)	All external cover/Panels present	HR
V2)	Cabinet and panels free from dents/scratches/damage	HR
V3)	Doors and panels fitted right and correctly alignment	HR
V4)	All instrument controls/fuse holders/connections all marked according to the schematic	HR
V5)	Sercon Logo/Vinyls fitted correctly to door and panels	HR
V6)	Unit rating/serial sticker correct and fitted to fixed rear panel	TBF
V7)	Mains isolation sticker fitted to all removable panels	HR
V8)	internal compartments free from dust and debris	HR

Mechanical Inspection

REF	Description	Initial
M1)	All fastenings fitted correctly I.E Flat washers and shakeproof washer ETC	HR
M2)	All fastenings tight and tightened to the correct torque where applicable	HR
M3)	All cooling fans fitted correctly with air flow in the right direction and guards present	HR
M4)	All plumbing bulkheads and fittings fitted correctly and tightend to required torque	HR
M5)	All piping secure and free from kinks ETC	HR
M6)	All Valves/Pipework/Fittings labelled correctly	HR

Electrical Inspection

REF	Description	Initial
E1)	Equipotential earth bonding to all removable panels	
E2)	All cable terminations tight and correctly crimped	HR
E3)	All Cable identifications and sizes correct to the schematic drawing	HR
E4)	Ribbon cables fitted and "Checked" label applied	HR
E5)	All fuses fitted to holders and are correct rating as schematic drawing	HR
E6)	All instrument cables supplied with unit	HR

Testing

REF	Description	Initial
T1)	Use 24V test power supply to run and check correct operation of the unit cooling fans	HR
T2)	P.A.T unit	HR
T3)	P.A.T Sticker filled in and applied to the rear of unit	HR
T4)	P.A.T results logged in the blue book	HR

7: ASSEMBLY AND TEST RECORD

Client:	TONOKU University C/O: Taiyo Nippon Sango Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

 PRODUCT: ISO-EARTH (10202/13)

 SERIAL NUMBER: 1020413-2026-11377

 ASSEMBLED:
 (Name)

Ma

 Date: 11/03/26

 PRE-TEST
 INSPECTION:
 (Production name)

[Signature]

 Date: 11/03/26

 PRE-TEST
 INSPECTION:
 (Test name)

DK

 Date: 12/03/26

 SYSTEM TEST:
 (Name)

DA

 Date: 12/05/26

 PRE-DESPATCH
 INSPECTION:
 (Name)

[Signature]

 Date: 14/05/26

P.A.T. Test results

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

 Earth Continuity 0.79 Ω

 Insulation 1.57 34 M Ω

 Earth Leakage Current 1.05 mA. @ 0.5 kVA.

 Tested by: [Signature]

 Date: 11/03/26

**sercon**

Date: 11/3/26

Production Handover Checklist

Unit Name	ISO - Earth +
Product Code	10202
Customer	Hokoku University
Unit IN/Stock Number	101377

Visual Inspection

REF	Description	Initial
V1)	All external cover/Panels present	SW
V2)	Cabinet and panels free from dents/scratches/damage	SW
V3)	Doors and panels fitted right and correctly alignment	SW
V4)	All instrument controls/fuse holders/connections all marked according to the schematic	SW
V5)	Sercon Logo/Vinyls fitted correctly to door and panels	✓IBF
V6)	Unit rating/serial sticker correct and fitted to fixed rear panel	✓IBF
V7)	Mains isolation sticker fitted to all removable panels	SW
V8)	internal compartments free from dust and debris	SW

DH

Mechanical Inspection

REF	Description	Initial
M1)	All fastenings fitted correctly I.E Flat washers and shakeproof washer ETC	SW
M2)	All fastenings tight and tightened to the correct torque where applicable	
M3)	All cooling fans fitted correctly with air flow in the right direction and guards present	SW
M4)	All plumbing bulkheads and fittings fitted correctly and tightend to required torque	SW
M5)	All piping secure and free from kinks ETC	SW
M6)	All Valves/Pipework/Fittings labelled correctly	SW

Electrical Inspection

REF	Description	Initial
E1)	Equipotential earth bonding to all removable panels	✓IBF
E2)	All cable terminations tight and correctly crimped	SW
E3)	All Cable identifications and sizes correct to the schematic drawing	SW
E4)	Ribbon cables fitted and "Checked" label applied	SW
E5)	All fuses fitted to holders and are correct rating as schematic drawing	SW
E6)	All instrument cables supplied with unit	SW

Testing

REF	Description	Initial
T1)	Use 24V test power supply to run and check correct operation of the unit cooling fans	SW
T2)	P.A.T unit	✓IBF
T3)	P.A.T Sticker filled in and applied to the rear of unit	✓IBF
T4)	P.A.T results logged in the blue book	✓IBF

Works Order Picking List

Date: 05/02/2026

Time: 10:06:13

Works Order: WO02620
 Stock Code: 10202/13
 Description: iso-EArth+
 Qty Required: 1.00 Each
 Qty Outstanding: 1.00
 Plan Period: WK6/2026
 Due Date: 31/03/2026

PART
ISSUED
5/2/26
SS

Stock Code / Description Qty to Pick Unit Location Qty Picked / By
 Manufacturing Instructions: IN1377 - Tohoku University

9099/1 Instrument Packing	1.00	Each		
70501-5 CNS Start Up Kit (1000 Samples)	1.00	Each	@	
SI2416 PyroEarth Cabinet Full Assy Rev003	1.00	Each	C1	
SI3237 Inrush Current Limiters 22m 4ohms 14A (EA)	1.00	Each	Carousel 1 - N1	1
SI0201 1/16 O/D x 10-32 UNFM.SS	4.00	Each	Carousel 1 M-1	4
SI0607 Anti Surge T HBC Min Fuse 6.3A 5x20mm	2.00	Each	Carousel 1 M-1	2
SI1052 3 Way MOLEX Clip	2.00	Each	Carousel 1 M-1	2
SI1255 M5 Plug	1.00	Each	Carousel 1 M-1	1
SI1548 4A Fuse, Anti Surge 5x20mm	1.00	Each	Carousel 1 M-1	1
SI1784 4mm Y Fitting	1.00	Each	Carousel 1 M-1	1
SI2666 O Ring ID 4.47 OD 7.93 x 1.78	4.00	Each	Carousel 1 M-1	4
SI0701 1/4" PTFE Ferrules Pk/1	6.00	Each	Carousel 1 P-1	6
SI1900 Dowty Seal - M5	18.00	Each	Carousel 1 P-1	18
SI2244 Male Elbow 4mm to M5	4.00	Each	Carousel 1 P-1	4
SI0703 1/8-1/16" PTFE Reducing Ferrule Pk/1	15.00	Each	Carousel 1 P-3	15
SI0196 Reducing Union 1/4 x 1/16 SS	6.00	Each	Carousel 1 Q-1	6

Works Order Picking List

Date: 05/02/2026

Time: 10:06:13

Works Order: WO02620
 Stock Code: 10202/13
 Description: iso-EArth+
 Qty Required: 1.00 Each
 Qty Outstanding: 1.00
 Plan Period: WK6/2026
 Due Date: 31/03/2026

<u>Stock Code / Description</u>	<u>Qty to Pick</u>	<u>Unit</u>	<u>Location</u>	<u>Qty Picked / By</u>
SI1918 8 Way socket housing, 2.54mm pitch	2.00	Each	Carousel C-1	
SI0386 25 Way Machine Cont Straight D Plug, 750Vac	1.00	Each	Carousel D-3	
SI0388 9 Way Machine Cont Straight D Skt, 750Vac	3.00	Each	Carousel D-3	
SI0567 15 Way Solder Contact ZD Plug 5A 400 Vac	3.00	Each	Carousel D-3	
SI0570 15 way Solder Contact ZD skt 5A 400 Vac	1.00	Each	Carousel D-3	
SI0526 5 Way Socket Housing, 2.54mm Pitch	1.00	Each	D-V	
SC0030 Thermocouple K-Type 1.5mm Pk/1 (Send with 2 pin/2 Bullet Crimps)	2.00	Each	P-A2	
SC0073 Scrubber Tube 6mmODx4mmIDx250mmLong (TG-II) Pk/1	1.00	Each	P-B3	
SC0084 Scrubber Tube Water Threaded, Borosilicate Glass Pk/1	1.00	Each	P-B4	
SC0085 Cap Kit for Threaded Joints Caps & PTFE Backed Sil Seals pk2	2.00	Each	P-B4	
SC0082-I GC Column for INTEGRA-CN Pk/1 (J shape)	1.00	Each	PD-3	
SC2010 Separation Column Oxygen 1m ANCA-SL/GSL	1.00	Each	PD-3	
SC2502 Sulphur Column for PyroEArth	1.00	Each	PD-3	
SI0008 GSL Top Hat Adaptor	1.00	Each	Stores A	1
SI0076 Tube Coupling	2.00	Each	Stores A	2
SI0847 IEC Cord - Socket	4.00	Each	Stores A-2	4
SI0374 Terminal Block Section	11.00	Each	Stores A-3	11

Works Order Picking List

Date: 05/02/2026

Time: 10:06:13

Works Order: WO02620
 Stock Code: 10202/13
 Description: iso-EArth+
 Qty Required: 1.00 Each
 Qty Outstanding: 1.00
 Plan Period: WK6/2026
 Due Date: 31/03/2026

(ADD
 S13230 SS
 SWITCH)

Stock Code / Description

Qty to Pick

Unit

Location

Qty Picked / By

SI0559
 Solid State Relay 10A rms 24-280 Vac

4.00 Each Stores B-3

4

SI1492
 Red Round Illuminated Rocker Switch

1.00 Each Stores- B3

1

SI2411
 KVT 20 Split Cable Gland (inc locknut)

1.00 Each Stores B-6

1

SI2412
 KT 5 insert

1.00 Each Stores B-6

1

SI2790
 Halogen Heating Element Bulb with 3X Clips & Ceramic Connect

1.00 Each Stores C-1

1

SI0767
 6 Way VALCO

1.00 Each Stores D-1

1

SI2435
 Electronic Pressure Regulator

2.00 Each Stores D-1

2

SI0366
 Flow Meter PMFc3100V

2.00 Each Stores D-2

2

SI2296
 Precision Flow Control

1.00 Each Stores D-2

1

SI1241
 3 Way Solenoid Valve

2.00 Each Stores D-3

2

SI1242
 2 Way Solenoid Valve

5.00 Each Stores D-3

5

SI1245
 SOL Cable

2.00 Each Stores D-3

2

SI1251
 Autosampler Solenoid Valve

2.00 Each Stores D-3

2

SI0807
 Thermostat

1.00 Each Stores D-5

1

SI1710
 Temperature Controller - CAL3300

1.00 Each Stores D-7

1

SI0581
 Toroidal Transformer 1000VA 2x55V o/p

1.00 Each Stores D8

1

SI2311
 MicroFlow Mass Flow Controller Helium

1.00 Each Stores E-2

1

Works Order Picking List

Date: 05/02/2026

Time: 10:06:13

Works Order: WO02620
Stock Code: 10202/13
Description: iso-EArth+
Qty Required: 1.00 Each
Qty Outstanding: 1.00
Plan Period: WK6/2026
Due Date: 31/03/2026

<u>Stock Code / Description</u>	<u>Qty to Pick</u>	<u>Unit</u>	<u>Location</u>	<u>Qty Picked / By</u>
---------------------------------	--------------------	-------------	-----------------	------------------------

All items picked and packed as marked:

Date: ____/____/____ Signed: _____

Stock Allocated, Issued, Completed:

Date: ____/____/____ Signed: _____

7: ASSEMBLY AND TEST RECORD

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

 PRODUCT: Versa 4

 SERIAL NUMBER: 60101/4-2026/1377

 ASSEMBLED:
 (Name)

 Date: 19/02/2026

 PRE-TEST
 INSPECTION:
 (Production name)

 Date: 20/02/2026

 PRE-TEST
 INSPECTION:
 (Test name)

 Date: 20/02/2026

 SYSTEM TEST:
 (Name)

 Date: 03/03/2026

 PRE-DESPATCH
 INSPECTION:
 (Name)

 Date: 06/05/2026

P.A.T. Test results

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

Earth Continuity

 Ω
NA

Insulation

 $M\Omega$

Earth Leakage Current

mA. @ _____ kVA.

Tested by:

Date:

8 - Serial Numbers Record Document

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Units	S/N
MS/ABCA	
Integra 2	
Prep Unit 1	
Prep Unit 2/Misc	
Electronics Upgrade	
CETAC	
Gas Box	
Autosampler	
BCR	
Dual Heater Block	

Pump Kit and Optics	S/N
Turbo pump S	250747434
Turbo pump A	250747435
Rotary Pump	250757741 250704120
Voltage	110 / 240
Gauge S	250620018
Gauge A	250560588
Source	20102HS-269
Collector 1	20301-175
Collector 2	20501-075
Magnet	161

Parts	S/N
Fan PSU	
24V PSU	

PCBs	S/N
Electronics Box	20250015
Prep PCB	150-20260001
VFC PCB	25013
Watchdog PCB	
Head Amp PCB 1	25008
Head Amp PCB 2	25016
Electromagnet RP	

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

PC	S/N
PC	596PKC4
Monitor	3KG2B74
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:

Liquid Autosampler. 222941
 * Rotary Pump - 250704120

11 – Installation Report

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Contact:	Prof. Yosuke Yamada		
Date of Visit:	22 nd – 26 th June 2026	No. of Days:	5
Engineer:	David Harris		

Details of visit:

Arrived on site and inspected instrument.

HS2022, Aqua + VerSA, & IsoEarth+ had been installed by local engineers prior to Sercon engineer's arrival. HT-EA setup on desk top, but installation of unit and heating element had not begun.

Due to the number of USB ports required, and restrictions on the number of available USB ports on the PC, a USB hub was provided by Taiyo Nippon Sanso Corp. Hub installed and USB comms routed into PC. All comms with all units established – All OK.

HS2022

eMagnet moved as required to optimise peak shape and stability.

System leak check – All OK.

Flows and Ref Gas crimps adjusted as required – All OK.

Isolation valve from Aqua prep unit transferred correct location to allow HT-EA to be connected to Flow meter within 2022. Software updated in all projects.

All readbacks respond as expected – All OK.

Emissions reading back high in standby mode, but within normal levels when sample tuning files loaded. This is a common occurrence. Standby settings altered to optimise filament conditions – All OK.

Initially system setup to HD mode. Optimised HD tuning and eMagnet current as required – All OK.

HD ref gas tested for peak shape, 2/1 stability and HD precision (n=5, 5 second ref gas pulses). Results good – All OK.

eMagnet current set to high mass mode for testing of N₂, CO, CO₂, and SO₂ tuning. eMagnet responds as normal – All OK.

Optimised CO₂ and CO tuning via CO₂ Ref Gas.

Tested for 2/1 & 3/1 peak shapes, 2/1 & 3/1 stability, ¹³C (CO₂) & ¹⁸O (CO) precision (n=5, 5 second ref gas pulses).

¹³C (CO₂) Linearity check performed (n=6, 1,2,4,6,8,10 sec Ref Gas pulses).

CO₂ stability from cylinder source displayed wave instability pattern. Test repeated via trapped combusted sample in trapping loop. No instability seen – Investigated fault, no issues found within Sercon systems or back line plumbing. This implies that there is an issue coming from the CO₂ cylinder. Local engineer to investigate issue at later date.

N₂ Ref gas not available at time of Sercon engineer's visit. Tuning optimisation, 2/1 peak shape & 2/1 stability checks performed via IsoEarth prep trapping loop. All tests pass – All OK.

SO₂ tuning optimisation, 2/1 peak shape & 2/1 stability checks performed via IsoEarth prep trapping loop. All tests pass – All OK.

11 – Installation Report

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Ref Gas spec testing results...

<i>N₂ Peak Shape (2/1) = Pass</i>	<i>Ref Gas ¹⁵N Precision (n=5) = N/A</i>
<i>N₂ trapping loop Stability (2/1) = Pass</i>	
<i>SO₂ Peak Shape (2/1) = Pass</i>	<i>Ref Gas ³⁴S Precision (n=5) = N/A</i>
<i>SO₂ trapping loop Stability (2/1) = Pass</i>	
<i>CO₂ Peak Shape (2/1) = Pass</i>	<i>Ref Gas ¹³C Precision (n=5) = 0.014‰ S.D.</i>
<i>CO₂ trapping loop Stability (2/1) = Pass</i>	<i>Ref Gas ¹³C Linearity (n=6) = 0.050‰ S.D.</i>
<i>CO Peak Shape (3/1) = Pass</i>	<i>Ref Gas ¹⁸O Precision (n=5) = 0.262‰ S.D.</i>
<i>CO ref gas Stability (3/1) = Pass</i>	
<i>HD Peak Shape (2/1) = Pass</i>	<i>Ref Gas HD Precision (n=5) = 0.205‰ S.D.</i>
<i>HD ref gas Stability (2/1) = Pass</i>	

HS2022 system fully installed.

HT-EA & Liquid Autosampler

Installed HT furnace element – All OK.
 Installed HT-EA high sensitivity reaction tube & H₂O/CO₂ trap – All OK. Demonstrated to local engineer how prepare and install reaction tubes.
 Established He flows to HT-EA. Set He crimp on outer flow of alumina reaction tube. Flow modified during testing for optimum results. For sampling; Flow approx. 80ml/min at 28psi pressure.
 Powered on HTEA furnace – All OK.
 Established comms between HT-EA & PC – All OK.
 Furnace responds and heats with no issues – All OK.

Installed liquid autosampler to HT-EA – All OK.
 Established comms from Liquid Autosampler to PC & software. Ran through auto positioning setup procedure – All OK.
 Supplied training to local engineer on liquid autosampler software and general usage.
 Sercon advise of standby He flow of 15-20ml/min with HTEA furnace temp of 1000°C (to protect heating element from oxidising).
 System leak checked – All OK.
 GC oven temp set to 60°C for analysis.

Altered method, events and timing windows as required for current location & flows – All OK.
 HT furnace temp set to 1400°C for testing.
 Blank testing yielded low response – Pass.
 CO baseline background very low – Pass.
 Tested precision batch runs using local tap water for HD and ¹⁸O analysis. (n=5, 1µl sample size).
 All tests yield good results – All OK.
 United test to run from multiple vial samples – All OK.

11 – Installation Report

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Instrument setup as follows...

He pressure = 28psi.

He flow = 80ml/min

Pyrolysis furnace Temp = 1400°C.

HD (Pyrolysis from liquid sample) Precision = 0.407‰ S.D.

¹⁸O (Pyrolysis from liquid sample) Precision = 0.044‰ S.D.

All specs pass. HT-EA with liquid autosampler fully installed

IsoEarth+

System had had some prior testing carried out by local engineer.

Optimisation required.

New combustion tube installed. Advised user and local engineer of different tube setup depending on NCS or NC analysis modes.

Advised local engineer on setup for dilutor method. This will have to be set up as required by user to accommodate sample sizes.

System failed pressure test. Large leak from disconnected pipe to 6-way Valco valve located as source of issue. New pipework installed. Leak now resolved. Leak test - pass.

Adjusted method events and timings as required – All OK.

Customer located balance for weighing out samples for testing NCS batch analysis. The balance acquired is not accurate enough for sample weighing for IRMS systems. Cystine test samples weighted as accurately as possible, but not up to normal standards for precision testing. (n=5, 0.5/0.6mg cystine sample size). Is will result in a greater variability within data out-put.

Linearity testing performed in NC mode using AS Beet Mix dissolved in water. (n=6, N 10-200µg / C 25-500µg).

Initial testing resulted in issue with autosampler being exposed. Carousel stopped turning. Removed and rebuilt assembly. Carousel now turns correctly, however lower sample plate is misaligned. Engineer modified drop chute to help with alignment. When testing with small capsule sizes some samples did not drop into furnace correctly. Sercon engineer will follow up the issue with Sercon HQ to seek permanent solution.

N₂ blank sample testing good (<0.3nA signal on major beam) – Pass

IsoEarth instrument setup as follows...

He pressure = 25psi.

He flow = 60ml/min

O₂ pressure = 25 psi

O₂ flow = 70ml/min

Combustion furnace Temp = 1000°C.

Equilibration furnace Temp = 860°C.

Reduction furnace Temp = 600°C.

GC oven Temp = 60°C.

11 – Installation Report

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

IsoEarth+ batch data results ...

- ¹³C Combustion Precision (Cystine n=5) =0.087‰ S.D.
- ¹³C Combustion Linearity (AS Beet Mix, N=6) =0.060‰ S.D.
- ¹⁵N Combustion Precision (Cystine n=5) =0.130‰ S.D.
- ¹⁵N Combustion Linearity (AS Beet Mix, N=6) =0.096‰ S.D.
- ³⁴S Combustion Precision (Cystine n=5) =0.066‰ S.D.

All results pass spec – All OK.

Aqua & VerSA

Software adjustment required to allow for 240 samples to be taken from bespoke VerSA rack set up – All OK.
 Aqua unit already installed by local engineer. Further action required on install.
 Local engineer reports good results from testing.

Software & PCB Hardware

Updates required to Aqua PCB to alter active node to A due to cross comms issues with IsoEarth+.
 Node update required events update. All events altered as required. – All OK.

Bitmaps on all projects updated to allow for bespoke setup of systems – All OK.

N.B. GC oven temp for HT-EA usage needs to be set within IsoEarth+ project. As the GC oven is located within the IsoEarth+ assembly.

Callisto software version updated to 60.0.02 by local engineer prior to visit to accommodate vac gauge readback glitch – Issue resolved.

System installed
 Units handed to customer for usage.

Recommendations:

- Continue to liaise with local engineer for training and application help.
- High purity copper needs to be purchased for NCS combustion & equilibration tubes. If the user wants to run in NC mode, standard copper can be used.
- Investigate issue with CO₂ gas from cylinder. Issue presented a pressure fluctuations.

Faults and Shortages:

- Issue with autosampler. Engineer to report issue to Sercon HQ.

Follow up:

N/A

11 – Installation Report

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Engineer:	David Harris	Date:	26 June 2026
Signed:			

12 – Installation Acceptance and Warranty Certificate

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Contact:	Prof. Yosuke Yamada
System:	HS2022, Aqua & VerSA, IsoEArth+, HT-EA & liquid autosampler
Software:	Callisto: v60.0.2, Reprocessor: 50.0.0
Engineer:	David Harris
Installation Date:	26 th June 2026

Warranty commences:	06 June 2026
Warranty Expires:	06 June 2028

Customer Acceptance:

Name: Yosuke Yamada
 Signature: 山田陽介
 Date: 1st July 2026

Notes:
 N/A

Engineer's Signature:

On behalf of Sercon Limited

Name: David Harris
 Signature: [Signature]
 Date: 26th June 2026

Works Order Picking List

Date: 10/03/2026

Time: 10:45:00

Part Issued
10/3/26

Works Order: WO02656
Stock Code: 70501-14
Description: Liquid Sampler Option (HTA)
Qty Required: 1.00 Each
Qty Outstanding: 1.00
Plan Period: WK11/2026
Due Date: 10/03/2026

Stock Code / Description Qty to Pick Unit Location Qty Picked / By

Manufacturing Instructions: IN1377 - Tohoku University

71501-3 HT-EA Sensitivity Start Up Kit for O & H in small samples	1.00	Each		1
SI2743 Automatic Liquid Sampler15 positions Configured: LEFT	1.00	Each		1
SI2744 Mounting Plate & Accessories	1.00	Each		1
SI0762 PSR16-16 PTFE Sealing Rings Pk/20	0.25	Each	Carousel 1 Q-1	0.25
SC2616 Septa (pack of 5) - TIC/TN 11mm	1.00	Each	P-A3	1
SI0346 SPDT plug-in power Relay - 10A 24V DC coil	1.00	Each	Stores B-2	1
SI0347 SPCO Relay Base	1.00	Each	Stores B-2	1
SI2210 SSUT-16 SS UNION TEE	1.00	Each	Stores C-4	1
SI0047 Liquid Sampler Adaptor	1.00	Each	Stores E-8	1
SI3025 Liquid sampler Guide Cap	1.00	Each	Stores E-8	1
SI3040 StarTech1 Port USB 3.0 Ethernet Adapter, 10/100/1000Mbit/s	1.00	Each	Stores J-3	1

All items picked and packed as marked:

Date: ____/____/____ Signed: _____

Stock Allocated, Issued, Completed:

Date: ____/____/____ Signed: _____



Packing List

Customer Reference: SC-105-009

Shipper / Exporter:

Sercon Limited
Europa House
Coppicemere Drive
Crewe
CW1 6GZ
UK

Tel: +44 (0)1270 580008
Reference: IN1377

Consignee:

Sports and Health Sciences, Graduate School of
Biomedical Engineering,
Medicine and Science in Sports and Exercise, Graduate
School of Medicine,
Tohoku University
2-1, Seiryomachi, Aoba-ku, SENDAI 980-8575, JAPAN

Contact Name: Sports and Health Sciences
Contact Tel Number: +81-22-717-8588

BOX: 1

Quantity	Product Code	Product Description	Serial Number: if available
☒ 1	20402/4	HS2022	20402/4-2026/1377

Packed by:

Date:

14/05/20

Claims for damage or shortages must be made within 3 days



S035b_v6

Sercon Limited
Europa House, Coppicemere Drive
Crewe, Cheshire
CW1 6GZ, U.K.
Company Registration No.: 4290072

Phone: +44 (0) 1270 580008

sales@sercongroup.com
www.sercongroup.com
VAT No.: 771 1100 74
19/01/2017

Packing List

Customer Reference: SC-105-009

Shipper / Exporter:

Sercon Limited
Europa House
Coppicemere Drive
Crewe
CW1 6GZ
UK

Tel: +44 (0)1270 580008
Reference: IN1377

Consignee:

Sports and Health Sciences, Graduate School of
Biomedical Engineering,
Medicine and Science in Sports and Exercise, Graduate
School of Medicine,
Tohoku University
2-1, Seiryomachi, Aoba-ku, SENDAI 980-8575, JAPAN

Contact Name: Sports and Health Sciences
Contact Tel Number: +81-22-717-8588

BOX: 2

Quantity	Product Code	Product Description	Serial Number: if available
☐ 1	10202/13	ISO-Earth + External Piping Trigger Cable	10202/13-2026/1377

Packed by:



Date:

14/05/20

Claims for damage or shortages must be made within 3 days



Packing List

Customer Reference: SC-105-009

Shipper / Exporter:

Sercon Limited
Europa House
Coppicemere Drive
Crewe
CW1 6GZ
UK

Tel: +44 (0)1270 580008
Reference: IN1377

Consignee:

Sports and Health Sciences, Graduate School of
Biomedical Engineering,
Medicine and Science in Sports and Exercise, Graduate
School of Medicine,
Tohoku University
2-1, Seiry-machi, Aoba-ku, SENDAI 980-8575, JAPAN

Contact Name: Sports and Health Sciences
Contact Tel Number: +81-22-717-8588

BOX: 3

Quantity	Product Code	Product Description	Serial Number: if available
☒ 1	11501/7 SI1858	HT-EA HT Furnace Element Liquid Sampler Spare Parts	11501/7-2026/1377

Packed by:

Date:

14/05/20

Claims for damage or shortages must be made within 3 days



S035b_v6

Sercon Limited
Europa House, Coppicemere Drive
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CW1 6GZ, U.K.
Company Registration No.: 4290072

Phone: +44 (0) 1270 580008

sales@sercongroup.com
www.sercongroup.com
VAT No.: 771 1100 74
19/01/2017

Packing List

Customer Reference: SC-105-009

Shipper / Exporter:

Sercon Limited
Europa House
Coppicemere Drive
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CW1 6GZ
UK

Tel: +44 (0)1270 580008
Reference: IN1377

Consignee:

Sports and Health Sciences, Graduate School of
Biomedical Engineering,
Medicine and Science in Sports and Exercise, Graduate
School of Medicine,
Tohoku University
2-1, Seiryō-machi, Aoba-ku, SENDAI 980-8575, JAPAN

Contact Name: Sports and Health Sciences
Contact Tel Number: +81-22-717-8588

BOX: 4

Quantity	Product Code	Product Description	Serial Number: if available
☒ 1	60101/4	Versa 4	60101/4-2026/1377
☒ 1	SI3089	Extra Base Plate For Alternative Tube Racks	
☒ 5	SI1770	Versa Tube Racks	

Packed by:



Date:

14/05/20

Claims for damage or shortages must be made within 3 days

Packing List

Customer Reference: SC-105-009

Shipper / Exporter:

Sercon Limited
Europa House
Coppicemere Drive
Crewe
CW1 6GZ
UK

Tel: +44 (0)1270 580008
Reference: IN1377

Consignee:

Sports and Health Sciences, Graduate School of
Biomedical Engineering,
Medicine and Science in Sports and Exercise, Graduate
School of Medicine,
Tohoku University
2-1, Seiryō-machi, Aoba-ku, SENDAI 980-8575, JAPAN

Contact Name: Sports and Health Sciences
Contact Tel Number: +81-22-717-8588

BOX: 5

Quantity	Product Code	Product Description	Serial Number: if available
☒ 1	10302/1	Aqua system	10302/1-2026/1377
☒ 1	SI2737	Solid autosampler	42723
☒ 1	70201-1	Analyser spares kit	
☒ 1	70501-3	Sampler preparation kit	
☒ 1	70501-5	Start up consumables	
☒ 1	70801-1	Pyrolysis start up kit	
☒ 1	71501-1	HT-EA pyrolysis start up kit	
☒ 1	71501-3	HT-EA sensitivity start up kit	
☒ 1	71801-2	Aqua start up kit	
☒ 2	SC8500A	12 ml 15.5x101mm breath sampling vial	
☒ 5	SI2510	Japanese mains cable	
☒ 1	SI3022	Versa PSU	
☒ 2	SI2515	Versa needle	
☒ 1	SI0837	Nafion Dryer	
☐			
☐			
☐			
☐			
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Packed by:

Date:


14/05/20

Claims for damage or shortages must be made within 3 days

Packing List

Customer Reference: SC-105-009

Shipper / Exporter:

Sercon Limited
Europa House
Coppicemere Drive
Crewe
CW1 6GZ
UK

Tel: +44 (0)1270 580008
Reference: IN1377

Consignee:

Sports and Health Sciences, Graduate School of
Biomedical Engineering,
Medicine and Science in Sports and Exercise, Graduate
School of Medicine,
Tohoku University
2-1, Seiryō-machi, Aoba-ku, SENDAI 980-8575, JAPAN

Contact Name: Sports and Health Sciences
Contact Tel Number: +81-22-717-8588

BOX: 6

Quantity	Product Code	Product Description	Serial Number: if available
☒ 1		Engineers kit	
☒ 1	SI2391	Monitor	3KG2B74
☒ 1	SI2391	PC	JG6PKC4
☒ 2	CON002	Step Up Transformer	
☒ 1	SI1719	Edwards 110V rotary pump	250704120
☒ 1	SI2743	Liquid autosampler	222941
☒ 1		Ceramic tube	
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Packed by:



Date:

14/05/2017

Claims for damage or shortages must be made within 3 days



COLLECTION NOTE

Job Number: **IN1377**
Customer: Taiyo Nippon Sanso
Contact: Takashi Ohno

Collection on

Date: 15.05.26

No.

of boxes: 6 Pallets

By: TRILogy
Company:

Vehicle
Reg No. MF7100V

Signature: Abdirasid Ibrahim

Print: ABDIRASID IBRAHIM



S062_v3

Sercon Ltd
Europa House, Coppicemere Drive,
Crewe, Cheshire
CW1 6GZ U.K.
Registered in England and Wales: 4290072

Phone: +44 (0) 1270 580008
sales@sercongroup.com
www.sercongroup.com
VAT No.: 771 1100 74
19/01/2017

11 – Installation Report

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Contact:	Prof. Yosuke Yamada		
Date of Visit:	22 nd – 26 th June 2026	No. of Days:	5
Engineer:	David Harris		

Details of visit:

Arrived on site and inspected instrument.

HS2022, Aqua + VerSA, & IsoEarth+ had been installed by local engineers prior to Sercon engineer's arrival. HT-EA setup on desk top, but installation of unit and heating element had not begun.

Due to the number of USB ports required, and restrictions on the number of available USB ports on the PC, a USB hub was provided by Taiyo Nippon Sanso Corp. Hub installed and USB comms routed into PC. All comms with all units established – All OK.

HS2022

eMagnet moved as required to optimise peak shape and stability.

System leak check – All OK.

Flows and Ref Gas crimps adjusted as required – All OK.

Isolation valve from Aqua prep unit transferred correct location to allow HT-EA to be connected to Flow meter within 2022. Software updated in all projects.

All readbacks respond as expected – All OK.

Emissions reading back high in standby mode, but within normal levels when sample tuning files loaded. This is a common occurrence. Standby settings altered to optimise filament conditions – All OK.

Initially system setup to HD mode. Optimised HD tuning and eMagnet current as required – All OK.

HD ref gas tested for peak shape, 2/1 stability and HD precision (n=5, 5 second ref gas pulses). Results good – All OK.

eMagnet current set to high mass mode for testing of N₂, CO, CO₂, and SO₂ tuning. eMagnet responds as normal – All OK.

Optimised CO₂ and CO tuning via CO₂ Ref Gas.

Tested for 2/1 & 3/1 peak shapes, 2/1 & 3/1 stability, ¹³C (CO₂) & ¹⁸O (CO) precision (n=5, 5 second ref gas pulses).

¹³C (CO₂) Linearity check performed (n=6, 1,2,4,6,8,10 sec Ref Gas pulses).

CO₂ stability from cylinder source displayed wave instability pattern. Test repeated via trapped combusted sample in trapping loop. No instability seen – Investigated fault, no issues found within Sercon systems or back line plumbing. This implies that there is an issue coming from the CO₂ cylinder. Local engineer to investigate issue at later date.

N₂ Ref gas not available at time of Sercon engineer's visit. Tuning optimisation, 2/1 peak shape & 2/1 stability checks performed via IsoEarth prep trapping loop. All tests pass – All OK.

SO₂ tuning optimisation, 2/1 peak shape & 2/1 stability checks performed via IsoEarth prep trapping loop. All tests pass – All OK.

11 – Installation Report

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Ref Gas spec testing results...

N₂ Peak Shape (2/1) = Pass
N₂ trapping loop Stability (2/1) = Pass

Ref Gas ¹⁵N Precision (n=5) = N/A

SO₂ Peak Shape (2/1) = Pass
SO₂ trapping loop Stability (2/1) = Pass

Ref Gas 34S Precision (n=5) = N/A

CO₂ Peak Shape (2/1) = Pass
CO₂ trapping loop Stability (2/1) = Pass

Ref Gas ¹³C Precision (n=5) = 0.014‰ S.D.
Ref Gas ¹³C Linearity (n=6) = 0.050‰ S.D.

CO Peak Shape (3/1) = Pass
CO ref gas Stability (3/1) = Pass

Ref Gas ¹⁸O Precision (n=5) = 0.262‰ S.D.

HD Peak Shape (2/1) = Pass
HD ref gas Stability (2/1) = Pass

Ref Gas HD Precision (n=5) = 0.205‰ S.D.

HS2022 system fully installed.

HT-EA & Liquid Autosampler

Installed HT furnace element – All OK.
 Installed HT-EA high sensitivity reaction tube & H₂O/CO₂ trap – All OK. Demonstrated to local engineer how prepare and install reaction tubes.
 Established He flows to HT-EA. Set He crimp on outer flow of alumina reaction tube. Flow modified during testing for optimum results. For sampling; Flow approx. 80ml/min at 28psi pressure.
 Powered on HTEA furnace – All OK.
 Established comms between HT-EA & PC – All OK.
 Furnace responds and heats with no issues – All OK.

Installed liquid autosampler to HT-EA – All OK.
 Established comms from Liquid Autosampler to PC & software. Ran through auto positioning setup procedure – All OK.
 Supplied training to local engineer on liquid autosampler software and general usage.
 Sercon advise of standby He flow of 15-20ml/min with HTEA furnace temp of 1000°C (to protect heating element from oxidising).
 System leak checked – All OK.
 GC oven temp set to 60°C for analysis.

Altered method, events and timing windows as required for current location & flows – All OK.
 HT furnace temp set to 1400°C for testing.
 Blank testing yielded low response – Pass.
 CO baseline background very low – Pass.
 Tested precision batch runs using local tap water for HD and ¹⁸O analysis. (n=5, 1µl sample size).
 All tests yield good results – All OK.
 United test to run from multiple vial samples – All OK.

11 – Installation Report

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Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Instrument setup as follows...

He pressure = 28psi.

He flow = 80ml/min

Pyrolysis furnace Temp = 1400°C.

HD (Pyrolysis from liquid sample) Precision = 0.407% S.D.

¹⁸O (Pyrolysis from liquid sample) Precision = 0.044% S.D.

All specs pass. HT-EA with liquid autosampler fully installed

IsoEarth+

System had had some prior testing carried out by local engineer.

Optimisation required.

New combustion tube installed. Advised user and local engineer of different tube setup depending on NCS or NC analysis modes.

Advised local engineer on setup for dilutor method. This will have to be set up as required by user to accommodate sample sizes.

System failed pressure test. Large leak from disconnected pipe to 6-way Valco valve located as source of issue. New pipework installed. Leak now resolved. Leak test - pass.

Adjusted method events and timings as required – All OK.

Customer located balance for weighing out samples for testing NCS batch analysis. The balance acquired is not accurate enough for sample weighing for IRMS systems. Cystine test samples weighted as accurately as possible, but not up to normal standards for precision testing. (n=5, 0.5/0.6mg cystine sample size). Is will result in a greater variability within data out-put.

Linearity testing performed in NC mode using AS Beet Mix dissolved in water. (n=6, N 10-200µg / C 25-500µg).

Initial testing resulted in issue with autosampler being exposed. Carousel stopped turning. Removed and rebuilt assembly. Carousel now turns correctly, however lower sample plate is misaligned. Engineer modified drop chute to help with alignment. When testing with small capsule sizes some samples did not drop into furnace correctly. Sercon engineer will follow up the issue with Sercon HQ to seek permanent solution.

N₂ blank sample testing good (<0.3nA signal on major beam) – Pass

IsoEarth instrument setup as follows...

He pressure = 25psi.

He flow = 60ml/min

O₂ pressure = 25 psi

O₂ flow = 70ml/min

Combustion furnace Temp = 1000°C.

Equilibration furnace Temp = 860°C.

Reduction furnace Temp = 600°C.

GC oven Temp = 60°C.

11 – Installation Report

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
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IsoEarth+ batch data results ...

- ¹³C Combustion Precision (Cystine n=5) =0.087‰ S.D.
- ¹³C Combustion Linearity (AS Beet Mix, N=6) =0.060‰ S.D.
- ¹⁵N Combustion Precision (Cystine n=5) =0.130‰ S.D.
- ¹⁵N Combustion Linearity (AS Beet Mix, N=6) =0.096‰ S.D.
- ³⁴S Combustion Precision (Cystine n=5) =0.066‰ S.D.

All results pass spec – All OK.

Aqua & VerSA

Software adjustment required to allow for 240 samples to be taken from bespoke VerSA rack set up – All OK.
Aqua unit already installed by local engineer. Further action required on install.
Local engineer reports good results from testing.

Software & PCB Hardware

Updates required to Aqua PCB to alter active node to A due to cross comms issues with IsoEarth+.
Node update required events update. All events altered as required. – All OK.

Bitmaps on all projects updated to allow for bespoke setup of systems – All OK.

N.B. GC oven temp for HT-EA usage needs to be set within IsoEarth+ project. As the GC oven is located within the IsoEarth+ assembly.

Callisto software version updated to 60.0.02 by local engineer prior to visit to accommodate vac gauge readback glitch – Issue resolved.

System installed

Units handed to customer for usage.

Recommendations:

- Continue to liaise with local engineer for training and application help.
- High purity copper needs to be purchased for NCS combustion & equilibration tubes. If the user wants to run in NC mode, standard copper can be used.
- Investigate issue with CO₂ gas from cylinder. Issue presented a pressure fluctuations.

Faults and Shortages:

- Issue with autosampler. Engineer to report issue to Sercon HQ.

Follow up:

N/A

11 – Installation Report

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Engineer:	David Harris	Date:	26 June 2026
Signed:			

12 – Installation Acceptance and Warranty Certificate

Client:	Tohoku University C/O: Taiyo Nippon Sanso Corp		
Quotation Number:	19214	Date:	29/08/2025
Job Number:	IN1377	Date:	21/01/2026

Contact:	Prof. Yosuke Yamada
System:	HS2022, Aqua & VerSA, IsoEArth+, HT-EA & liquid autosampler
Software:	Callisto: v60.0.2, Reprocessor: 50.0.0
Engineer:	David Harris
Installation Date:	26 th June 2026

Warranty commences:	06 June 2026
Warranty Expires:	06 June 2028

Customer Acceptance:

Name: Yosuke Yamada
 Signature: 山田陽介
 Date: 1st July 2026

Notes:
 N/A

Engineer's Signature:

On behalf of Sercon Limited

Name: David Harris
 Signature: [Signature]
 Date: 26th June 2026

Works Order Picking List

Date: 29/09/2025

Time: 09:16:51

Works Order: WO02528
Stock Code: 11501/4
Description: HT-EA (With Autosampler)
Qty Required: 1.00 Each
Qty Outstanding: 1.00
Plan Period: WK40/2025
Due Date: 31/10/2025

App 511667
 ADD mains cable

Stock Code / Description **Qty to Pick** **Unit** **Location** **Qty Picked / By**
Manufacturing Instructions: STOCK - 015

70801-1 Pyrolysis Start Up Kit high temp for Solids	1.00	Each		
71501-1 HT-EA Pyrolysis Start Up Kit O and H (USED IN BUILD)	1.00	Each		
9099/1 Instrument Packing	1.00	Each		
SI2599 HT-EA Furnace Unit Rev005	1.00	Each	C	1
SI2660 HT-EA Artwork	1.00	Each	C	
SI1712 Brass Tube Fitting, Male Connector 1/8in. OD x 1/4in. Male NPT	2.00	Each	Carousel 1 M-1	2
SI1900 Dowty Seal - M5	2.00	Each	Carousel 1 P-1	2
SI2244 Male Elbow 4mm to M5	4.00	Each	Carousel 1 P-1	4
SI0703 1/8-1/16" PTFE Reducing Ferrule Pk/1	6.00	Each	Carousel 1 P-3	6
SI2652 Valve Adapter Plate	1.00	Each	Carousel 1 P-3	1
SI0212 Reducing Union 1/8 OD x 1/16 OD SS	1.00	Each	Carousel 1 Q-1	1
SI1349 Pneumatic Bulkhead Check Valve - 4mm	2.00	Each	Carousel 1 Q-1	2
SI1603 Bulkhead Fitting 4mm - 1/8 (RS 7714923)	1.00	Each	Carousel 1 Q-1	1
SI1604 Male Connector 1/8 UNION 1/8	1.00	Each	Carousel 1 Q-1	1
SI1774 1/8 Female Coupling BSP	1.00	Each	Carousel 1 Q-1	1
SI2471 Bulkhead Retainer 1/8"	2.00	Each	Carousel 1 Q-1	2

Works Order Picking List

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Works Order: WO02528
Stock Code: 11501/4
Description: HT-EA (With Autosampler)
Qty Required: 1.00 Each
Qty Outstanding: 1.00
Plan Period: WK40/2025
Due Date: 31/10/2025

<u>Stock Code / Description</u>	<u>Qty to Pick</u>	<u>Unit</u>	<u>Location</u>	<u>Qty Picked / By</u>
SI3035 C20 Panel Mount Male Connector	1.00	Each	Stores A-5	1
SI0629 120mm Fan Guard	3.00	Each	Stores A-6	2.3
SI0630 80mm Fan Guard	4.00	Each	Stores A-6	3.4
SI0793 80mm DC Fan	3.00	Each	Stores A-6	3
SI1418 80mm Fan Screen Filter	2.00	Each	Stores A-6	2
SI1737 B/bearing axial fan, 119sqx25mm 24V med	2.00	Each	Stores A-6	2
SI0329 Flatpack Fan (for GSL)	1.00	Each	Stores A-7	1
SI0373 34 Way IDC Terminal Block	1.00	Each	Stores A-8	1
SI0508 24V PSU	1.00	Each	Stores A-8	1
SI1236 Levelling Foot - M10x38mm	4.00	Each	Stores A-8	4
SI0347 SPCO Relay Base	1.00	Each	Stores B-2	1
SI0355 DPCO Plug-in Relay, 10A 24V DC coil	1.00	Each	Stores B-2	1
SI2608 30A Rail Mount Fuse Holder	1.00	Each	Stores B-3	1
SI3034 SSR 25AMP Pyroearth.	1.00	Each	Stores B-3	1
SI2604 Rocker Switch (DPST)	1.00	Each	Stores B-4	1
SI2411 KVT 20 Split Cable Gland (inc locknut)	1.00	Each	Stores B-6	1
SI2412 KT 5 insert	1.00	Each	Stores B-6	1

Works Order Picking List

Date: 29/09/2025
Time: 09:16:51

Works Order: WO02528
Stock Code: 11501/4
Description: HT-EA (With Autosampler)
Qty Required: 1.00 Each
Qty Outstanding: 1.00
Plan Period: WK40/2025
Due Date: 31/10/2025

<u>Stock Code / Description</u>	<u>Qty to Pick</u>	<u>Unit</u>	<u>Location</u>	<u>Qty Picked / By</u>
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All items picked and packed as marked:

Date: ____/____/____ Signed: _____

Stock Allocated, Issued, Completed:

Date: ____/____/____ Signed: _____