Engineer Report

Completed:	☑	**Job Number:**	11546
Client:	University of Birmingham	**Site:**	Birmingham 2
Visit Type:	Routine Service	**Engineer**	Aaron Lowe
Start Date:	19/10/2022	**End Date:**	20/10/2022
Start Time:	10:00	**End Time:**	13:00
Site Location:	52.4555,-1.928944	**Possible Parking:**	Parking is available in front of the site. Enter from Elm Road on pedestrian area by car.

Reason For Visit/Reported Fault:	**Routine Service of XACT, FIDAS and AE33 + Update AE33 Firmware (if required) + Download Data**

Description of Works

Include all works undertaken during the site visit & any issues or damages that were present

Service of AE33

- Pre checks completed
- AE33 firmware updated to 531, Software updated to 1.5.2.
- Optics chamber cleaned
- Chamber runners lubricated
- Cyclone filter cleaned
- Sample pipe cleaned
- Flow calibrated
- Flow verification completed
- Leak check completed
- 5 minute (15mins) interval Zero taken
- Post stats recorded
- Data downloaded

Service of Xact 625i

Tetracal S/N: 580
Radeye B20 S/N: 32578

Pre stats taken

- X-ray Leak tested no issues found. Ambient at 2 meters away 0.10uSv, ambient at 1 meter 0.10uSv, ambient at machine 0.10uSv. With X-ray on no issues found, 0.10uSv at machine.

- Emergency stop and safety switches tested and all working

- XRF check performed readings are within range <10%

- NB rod value confirmed with 60s spectra analysis @ 48kV and 1000uA
- All readings good Nb count of 431.

- QA upscales for past few days show good consistency.

- Flow and leak check conducted on both 10 and 2.5 leak check failed and Flow at 18.87
- Fixed leak at connection points to before switching Valve
- Cleaned PM 10 and 2.5 heads
- Flow, temperature and pressure calibrated
- Leak check passed
- Conducted final XRF check passed with a 2.91% difference overall

Post stats recorded
All tests in Pre and Post folders on main screen

Service of Fidas 200

- Pre stats recorded
- Pre zero conducted
- Pre flow and leak checked conducted
- Pre monodust check conducted

Cleaned flow path tubing. cleaned optics filter, performed a IADS clean, cleaned sample head, performed a Sensor calibration.

- Calibrated Flow
- Leak check performed (Passed)
- Calibrated monodust to bottle value
- Zero conducted
- Post stats recorded

PAT Testing Expiry:	**N/A**
AC Make/Model:	**N/A**
Comms Checked With:	**N/A**

Parts Required / Used / Delivered to Site

Part No	Required / Used / Delivered to	Part Description	Qty	Inv

				☐
				☐
				☐
				☐

Actions Required:
Include any actions that the administration team or client should undertake following this site visit

Risk Assessment

Likelihood	Impact	Risk Rating Key
1 Highly Unlikely	1 Slightly harmful	1-3 Low. Reduce if possible
2 Unlikely	2 Harmful	4-6 Medium. Plan action
3 Likely	3 Extremely harmful	7-9 High. Immediate action required

Risk	Cause	Countermeasure in place	Likeli-hood		Impact	Risk Rating	Extra Actions Req'd
Ladder Working at Height	Incorrect / damaged ladder, Slippery surface, Adverse weather	All ladders identified & checked routinely. Records kept. Training & toolbox talks on correct use. Where required, a special post stabiliser attachment is utilised.	1	x	2	2	
Manual Handling	Lack of training. Moving items to awkward locations, Lack of equipment or PPE	Training & Toolbox talks given. Larger items decanted into smaller lifts if possible or two person/trolley lift identified as required. Equipment available where identified as required.	1	x	2	2	
Working with hand tools	Lack of PPE or training. Faulty, old / badly maintained equipment	Equipment checked and maintained routinely Staff familiar and trained in use of equipment Used in accordance with manufacturers guidelines.	1	x	2	2	
Risk to public	Equipment left on pavement. Falling objects	Equipment stored correctly No obstructions on public walkway, Suitable barriers used if req. If working at height ensure tools secured before access/egress.	1	x	2	2	
Low Voltage Electric Use	Shock or electrocution from metal cased instruments	Visual inspection prior to commencing work Faulty kit removed from site or client made aware. Pat testing carried out where appropriate. Engineer trained on equipment being worked on Instrumentation maintained routinely.	1	x	2	2	
Slips and trips	Untidy site, trailing wires, spillages, inappropriate footwear	Good housekeeping observed Safety boots issued, worn & maintained to BS EN345.	1	x	2	2	
General Health & Safety	Tiredness. Lack of Concentration. Noisy environment	Rests taken if required on route to site Work scheduled to avoid over tired on weekly run. Ear defenders BS EN 352-1 to be worn if required.	1	x	2	2	
Gas Asphyxiation	Instrument leaking from Scrubber. Gas bottle venting into enclosed area.	Instruments well maintained Cabinet doors opened for 5 mins before entering. Cabinet door left fully open whilst working inside. If gases are stored in a gas cylinder store area, gas cylinder door should be left fully open instead, as the cabin and gas store area are linked air spaces. Engineers equipped with personal oxygen monitors	1	x	2	2	If any symptoms such as nausea, shortness of breath or higher heart rate occur or any sound of gas escaping is heard, then vacate the cabin as quickly as possible, even if the door is open
Driving	Road traffic accident. Driving when tired or during bad weather conditions	Driver licences assessed at recruitment. Vehicle checks carried out. Vehicles maintained routinely and records kept. Additional driving training avail. Cold weather kit carried and small amount of potable water.	1	x	3	3	
Personal safety	Theft/Personal assault	Equipment not left unattended Engineer to avoid confrontation with members of the public and self-awareness maintained.	1	x	2	2	
Sharps Awareness	Needles left on site and surrounding areas potential to wound	Sharps awareness training provided. Engineers have suitable footwear to protect them from injury CMCU notified to clear the site where possible.	1	x	2	2	
Waste Awareness	Human and animal waste around sites causing access issues	Engineers are mindful and look out / avoid mess on the ground areas Alert CMCU of the issue in order for action to be taken such as trees cut back and open areas created to discourage this.	1	x	2	2	
Site visits	Other attendees to the station could have Covid 19 and leave traces at the station.	Avoid attending site on the same day as another visitor ie LSO if it can be avoided. Be respectful of other's personal space if two people are on site.	1	x	1	1	

Risk Assessment

Likelihood	Impact	Risk Rating Key
1 Highly Unlikely	1 Slightly harmful	1-3 Low. Reduce if possible
2 Unlikely	2 Harmful	4-6 Medium. Plan action
3 Likely	3 Extremely harmful	7-9 High. Immediate action required

Risk	Cause	Countermeasure in place	Likeli-hood		Impact	Risk Rating	Extra Actions Req'd
Covid 19 Symptoms, self isolation, shielding and returning to work and notifications.	If symptomatic or exposed more chance of transfer to stations. Where someone has been at station and later tests positive notification must be made to client.	If engineer displays symptoms, is required to self isolate they will not attend site, or where an engineer has already attended site and then tests positive this will be reported immediately to client. Likewise government guidance on returning after any of the previously mentioned scenarios, will be strictly followed.	1	x	1	1	

Assessment Prepared by: Aaron Lowe **Date:** 19/10/2022

Serial Number:	626-00-180101A

Statistics	Pre Statistics	Post Statistics
Xact	*Click + to view*	*Click + to view*
Status		
Status		
Status		
Flow Inst	16.7	16.7
Flow Act	18.7	16.7
Leak Check Pres	A: fail B: fail	A: 113.53 B: 111.3
Pres Amb Act	750	742
Pres Amb Inst	748	741
Internal Temp	19	20.6
Detector Temp	26	23.3
Upscale Cr	1344	1239
Upscale Cd	104714	101001
Upscale Pb	5236	4851
Nb	431	431
Xact XRF Check	*Click + to view*	*Click + to view*
Element	20	20
Standard ID	44268	44268
EC	1	1
Actual Mass ng	41482	41482
Inst Mass ng	39456 (5%)	40553 (2%)
Element	25	25
Standard ID	44191	44191
EC	1	1
Actual Mass ng	56752	56752
Inst Mass ng	56706(0.08%)	56665 (0.1%)
Element	82	82
Standard ID	44220	44220
EC	2	2
Actual Mass ng	62029	62029
Inst Mass ng	58256(6.2%)	60027 (3.2%)
Element	30	30
Standard ID	44196	44196
EC	2	2
Actual Mass ng	20220	20220
Inst Mass ng	19086(5.7%)	18952 (6.4%)
Element	48	48
Standard ID	44208	44208
EC	3	3
Actual Mass ng	38871	38871
Inst Mass ng	36625(5.94%)	36851 (5.33%)

Reason for Visit:

Routine Service

Statistics	Pre Statistics	Post Statistics
AE22	*Click + to view*	*Click + to view*
AE33 / AE43	*Click + to view*	*Click + to view*
Serial Number	AE33-S07-00691	AE33-S07-00691
Time	09:59	09:25
Status	0	0
Inst flow main Screen lpm	5	5
zero first BC ng/m3	-173	-22
zero first UVPM ng/m3	-95	167
zero second BC ng/m3	-84	-34
zero second UVPM ng/m3	-39	173
zero third BC ng/m3	-86	-12
zero third UVPM ng/m3	-58	165
Measured flow through tape	5000	4960
Inst flow (advanced screen)	5004	5025
Flow Verification Result	passed	passed
leakage test %	1.6	1.4
inlet leakage %	0.2	0.2
clean air test	Passed	passed
stability test	Passed	passed
Tape Advance left	112	40
TCA08	*Click + to view*	*Click + to view*
MicroAeth	*Click + to view*	*Click + to view*

Reason for Visit:

Routine Service

Tetra Cal Serial No: 580

Statistics	Pre Statistics	Post Statistics
Thermo 5014i	*Click + to view*	*Click + to view*
TEOM PM2.5	*Click + to view*	*Click + to view*
TEOM PM10	*Click + to view*	*Click + to view*
FDMS PM2.5	*Click + to view*	*Click + to view*
FDMS PM10	*Click + to view*	*Click + to view*
1405F	*Click + to view*	*Click + to view*
1405DF	*Click + to view*	*Click + to view*
BAM1020	*Click + to view*	*Click + to view*
FIDAS	*Click + to view*	*Click + to view*
Serial Number	9424	9424
Time on Inst	10:46	10:39
Alarm 1	none	none
Alarm 2	none	none
Sensor Flow	4.8	4.8
Flow Velocity	9.61868	9.57776
Coincidence	0.26178	0.62
Suction Pumps	46	45
Weatherstation	yes	yes
IADS	37.3	47
Calibration	1.92115	0.625758
LED Temperature	38	41
Operating Modus	auto	auto
Measured Flow	4.96	4.8
Flow Offset	-0.25	-0.25
Leak Check Value	-0.23	-0.23
Flow Coefficient		
RH	86.03	97.77
Temperature	11.44	13.67
Pressure	1006	990.4
PMtot Zero	0	0
Cn Zero	0	0
Offset Adjust	2.64131	2.64208
Measured Peak	141.76	141.1
PM Amplification	1.238	1.234
Mono Dust Value	141.1	141.1
AQGuard	*Click + to view*	*Click + to view*
Partisol 2025	*Click + to view*	*Click + to view*
RP2000	*Click + to view*	*Click + to view*
MCZ-16	*Click + to view*	*Click + to view*