



บริษัท เอ็นไวร์ เซอร์วิส จำกัด

42 รามอินทรา 14 เขต 9 แขวงท่าแร้ง เขตบางเขน กรุงเทพมหานคร 10230 โทรศัพท์ 02-9435814-5 โทรสาร 02-9438201
ENVIR SERVICE CO.,LTD. 42 Ramindra 14 yeak 9, Tha Rang, Bangkok, Bankok 10230 Tel : 02-9435814-5 Fax : 02-9438201

Analyzer Performance Test

Calibrated Date: 01 July 2022

Instruments Information

Analyzer Type: NO/NO ₂ /NO _x Analyzer Model: 42C	Manufacturer Thermo Environmental SIN: 42CHL-0527613257
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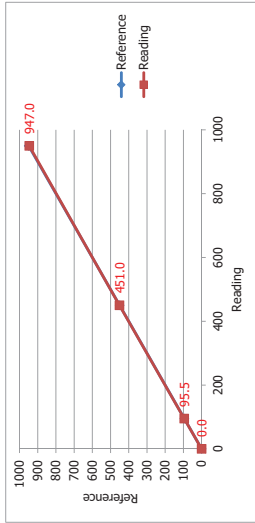
Calibration System

Calibrator Unit	Standard Gas
Dilutor Model Dasibi Model 5008 SIN: 705	NO Conc 957.2 PPM SO ₂ Conc 960.7 PPM CO Conc 960.4 PPM
ZERO AIR Generator API MODEL 701 SIN: 1924	Cylinder Number EB0128898 Expire Date: 28 Oct. 2027

Environment: Temperature 25.5 °C Humidity 51 %RH

CALIBRATION RESULTS

POINT NO	CALIBRATION RESULTS		
	Reference	Reading	%ERROR
ZERO	0	0.0	0.00
1	95	95.5	0.53
2	450	451.0	0.22
3	950	947.0	-0.32
			0.11



Calibrate By :  Mr. PASAGORN SAMOL



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Analyzer Performance Test

Calibrated Date: 01 July 2022

Instruments Information

Analyzer Type: SO ₂ Analyzer Model: 43C	Manufacturer Thermo Environmental SIN: 43CHL-59690-324
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Calibration System

Calibrator Unit	Standard Gas
Dilutor Model Dasibi Model 5008 SIN: 705	NO Conc 957.2 PPM SO ₂ Conc 960.7 PPM CO Conc 960.4 PPM
ZERO AIR Generator API MODEL 701 SIN: 1924	Cylinder Number EB0128898 Expire Date: 28 Oct. 2027

Environment: Temperature 25.5 °C Humidity 51 %RH

CALIBRATION RESULTS

POINT NO	CALIBRATION RESULTS		
	Reference	Reading	%ERROR
ZERO	0	0.0	0.00
1	95	94.9	-0.10
2	450	451.0	0.22
3	950	937.0	-13.00
			0.31



Calibrate By :  Mr. PASAGORN SAMOL

Maintenance Protocol PlasmaQuant PQ 9000 (Elite) ICP-OES



บริษัท เอ็นวีเอส เซอร์วิส จำกัด

42 ถนนมิตรภาพ 14 เขต 9 แขวงจันทบุรี เขตบางเขน กรุงเทพมหานคร 10230 โทรศัพท์ 02-9435814-5 โทรสาร 02-9435201
บริษัท เอ็นวีเอส เซอร์วิส จำกัด
ENVIS SERVICE CO., LTD. 42 Ramindra 14 yeak 9, Tha Rang, Bangkok, Bankok 10230 Tel : 02-9435814-5 Fax : 02-9438201

Analyzer Performance Test

Calibrated Date: 01 July 2022

Instruments Information

Analyzer Type: CO Analyzer Model: 48C	Manufacturer Thermo Environmental S/N: 48CHL-6327-339
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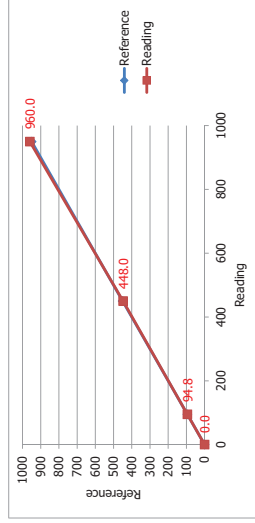
Calibration System

Calibrator Unit	Standard Gas
Dilutor Model Dasibi Model 5008 S/N: 705	NO Conc 957.2 PPM SO ₂ Conc 960.7 PPM CO Conc 960.4 PPM
ZERO AIR Generator API MODEL 701 S/N: 1924	Cylinder Number EB012898 Expire Date: 29 Oct. 2027

Environment: Temperature 25.5 °C Humidity: 51 %RH

CALIBRATION RESULTS

POINT NO	CALIBRATION RESULTS		
	Reference	Reading	%ERROR
ZERO	0	0.0	0.00
1	95	94.8	-0.21
2	450	448.0	-0.44
3	950	960.0	1.05
			0.10



Calibrate By : 
Mr. PASAGORN SAMOL



1 Customer and service data

Customer address	
Company	บ.เฮลธ์ แอนด์ เอ็นไวเทค จำกัด
Department	QC
Address (street, number, zip code, city)	6 ซอยงามวงศ์วาน 5 ต.บางเขน อ.เมือง จ.นนทบุรี 11000
Phone	
E-mail	
Customer number	
Order number	

Device data (model and serial number)

ICP OES	PQ9000
Mobile cooling unit	PolyScience
Autosampler	-

Analytik Jena representative information

Name	Mr.Puktija somton
Company	Analytik-Jena Fareast Thailand

Maintenance date

Date	11/10/2022
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3 Maintenance work on the base unit

Update firmware and software

	Complies	Does not comply
Save device parameters and neon table	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Check the firmware version and FPGA	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Check the version of the ASpect PQ software	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Update software, FPGA and firmware	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Approval for firmware and software updates was given by the customer.		
The customer's was informed that the Operational Qualification (OQ) and software validation may have to be repeated for validated systems after a firmware/software update.		
Update ASpect PQ	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Current version	1.2.3.0	<input type="checkbox"/>
▪ Version after update	—	<input type="checkbox"/>
Update FPGA	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Current version	h09; h00	<input type="checkbox"/>
▪ Version after update	—	<input type="checkbox"/>
Updating the firmware	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Current version	1.36	<input type="checkbox"/>
▪ Version after update	—	<input type="checkbox"/>
Record running time (in hours)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Base unit	3031	<input type="checkbox"/>
▪ RF generator	1770	<input type="checkbox"/>

Service the rear of the device

	Complies	Does not comply
Replace the air filter mat	<input checked="" type="checkbox"/>	<input type="checkbox"/>

2 Maintenance with subsequent Operational Qualification (OQ)

- If an Operational Qualification (OQ) is carried out after maintenance, there is no need to check analytical parameters in the maintenance report.
- The analytical parameters are then checked in the separate OQ report.

Maintenance with subsequent Operational Qualification (OQ)	Yes	No
	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments:

Service the spectrometer

		Complies	Does not comply
Clean and lubricate the spindle of the prism and grating with a little oil		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Check gas flows at the gas box

Gas flow	Rated value	Actual value	Complies	Does not comply
Nebulizer gas flow	0.5 L/min ± 15 %	0.512	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Auxiliary gas flow	0.5 L/min ± 15 %	0.506	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cone gas flow	1,7 ... 2,8 L/min	2.7	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Oxygen is used (optional)			<input type="checkbox"/>	<input type="checkbox"/>
Oxygen flow	00.5 L/min ± 15 %	-	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

Service the sample introduction system

	Complies	Does not comply
Remove, disassemble and clean the torch	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Check the surface of the glass parts (injector, inner tube, outer tube and glass holder) for damage, heavily coated and broken parts. Replace glass parts, if necessary		
▪ Clean glass parts in aqua regia		
Check the sealing rings, replace if necessary	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Sealing rings in torch holder (3 pieces) and torch shuttle (2 pieces)		
▪ Sealing rings in injector and mixing chamber mount		
(Check sealing rings for porous and hardened areas, replace if necessary)		
Check pump tubing (sample, waste), replace if necessary	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Check peristaltic pump, disassemble and lubricate if necessary	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Check the nebulizer for damage and clean it	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Remove and clean the mixing chamber	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Check the sealing ring of the mixing chamber	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Check and clean torch height adjustment drive	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lubricate the linear drive with a little oil	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Check the igniting pin for signs of wear	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Comments:

Service the plasma compartment

	Complies	Does not comply
Disassemble the cone, check geometry and clean it if necessary	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Take out the windows (axial/radial) and clean or replace them		
Replacing the sealing rings		
Check the surface of the first mirror, clean or replace it if necessary	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Check the air outlet for deposits and blockages, clean it if necessary	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Remove the cover plate below the plasma compartment and clean it	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Renew the filter mat		
Check the coil for its material condition, position, geometry and for the tightness of connections	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Clean or replace bonnet	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Check RF deflector spring, replace it if necessary	<input checked="" type="checkbox"/>	<input type="checkbox"/>