

ภาคผนวกที่ 4

ใบรับรองการสอบเทียบเครื่องมือ



บริษัท เอ็ม อี ที จำกัด MET Company Limited

36/659 หมู่ 6 ต.บางรักพัฒนา อ.บางบัวทอง จ. นนทบุรี 11110

36/659 Moo 6 Tambol Bangrakpattana Amphur Bangbuatong Nontaburi 11110

Tel : 0 2920 1458-9 Fax : 0 2920 1460 E-mail : met_jj@yahoo.com

TSP HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Sampler Location				Date	January 16, 2024
โรงเรียนวันดีประชาสรรค์				Start Time	9:05 AM
Sampler Number	TSP No.2	Transfer Standard Type	Orifice	Stop Time	9:10 AM
Motor Serial Number	BL-02	Calibrator Model	TE-5025A	Person	
Recorder Serial Number	-	Calibrator Serial Number	1		

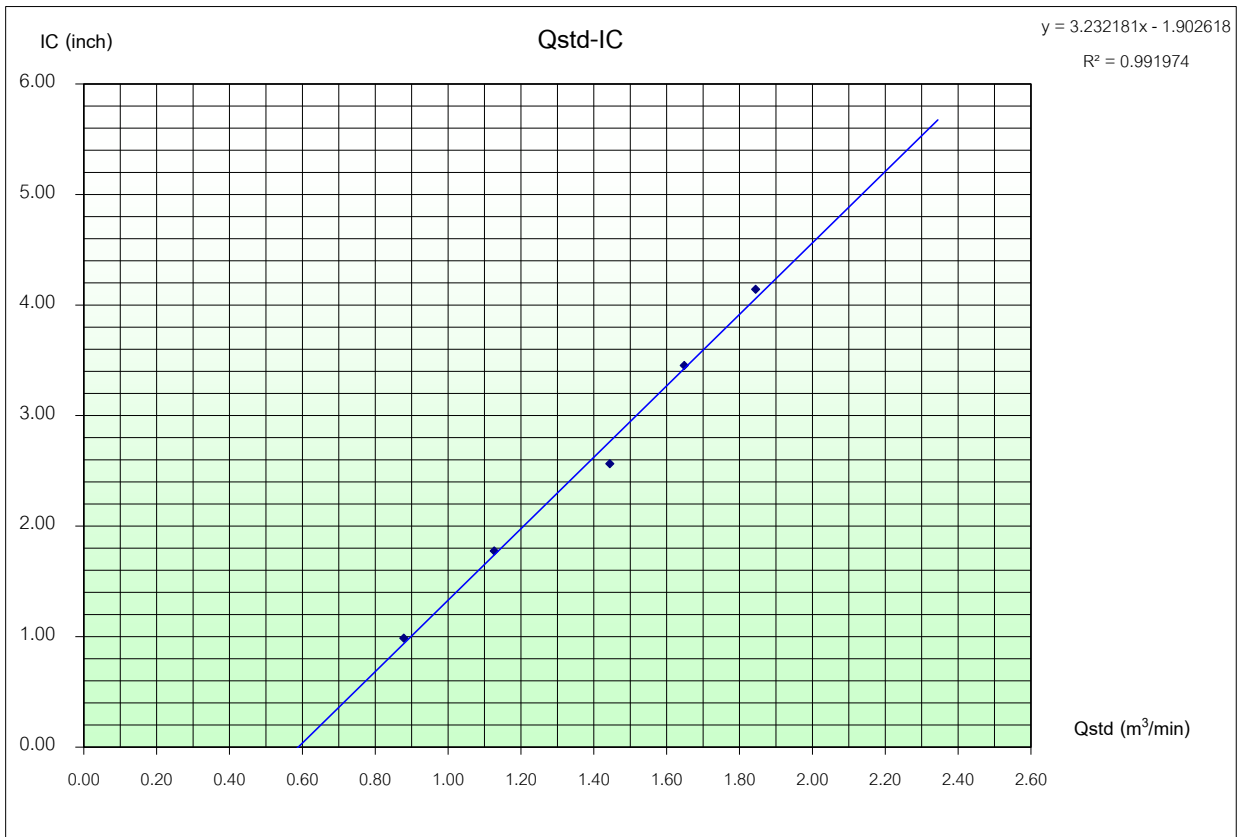
Plate No.	(Delta H)			(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter
	Pressure Drop Across Orifice (inH ₂ O)			$[\Delta H_2O(Pa/P_{std})(T_{std}/Ta)]^{1/2}$	$Q_{std} = (1/m)[(A-b)]$ (m ³ /min)	Sample Flow Rate Indication (inch)	$IC = [[(Pa/P_{std})(T_{std}/Ta)]^{1/2}]$	("K = °C+273)	(mmHg)		
	Positive	Negative	ΔH_2O								
5	1.5	1.5	3.0	1.70868	0.87849	1.0	0.99	305.0	757.0		
7	2.4	2.5	4.9	2.18372	1.12676	1.8	1.78	305.0	757.0		
10	4.0	4.0	8.0	2.79026	1.44374	2.6	2.56	305.0	757.0		
13	5.2	5.2	10.4	3.18138	1.64815	3.5	3.45	305.0	757.0		
18	6.5	6.5	13.0	3.55689	1.84440	4.2	4.14	305.0	757.0		

Linear Regression Y ON X : Y= mX + b

1	Slope (m)	1.91345	Linear Equation			r^2	0.971641	Pstd(mmHg)	760.0
2	Intercept (b)	0.02773	Set Point Flow Rate (X) (m ³ /min)	1.133		r	0.9857185	T _{NTP}	298.0
3	Correlation Coefficient (r)	0.99995	Final Set Flow Rate = (I)	0		(Pa/Pstd)*(Tstd/Ta)		0.973192407	
Result						C=(Pa/Pstd)*(Tstd/Ta)^0.5		0.986505148	

COMMENT

Andersen Instruments, Inc.



Calibrated By

Field Environmental

Division Manager



บริษัท เอ็ม อี ที จำกัด MET Company Limited

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Tel : 0 2920 1458-9 Fax : 0 2920 1460 E-mail : met_jj@yahoo.com

PM10 HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Sampler Location				Date	January 13, 2024
โรงเรียนวันดีประชาสรรค์				Start Time	1:20 PM
Sampler Number	PM-10 No.2	Transfer Standard Type	Orifice	Stop Time	1:25 PM
Motor Serial Number	HVL-02	Calibrator Model	TE-5025A	Person	<div></div>
Recorder Serial Number	-	Calibrator Serial Number	1		

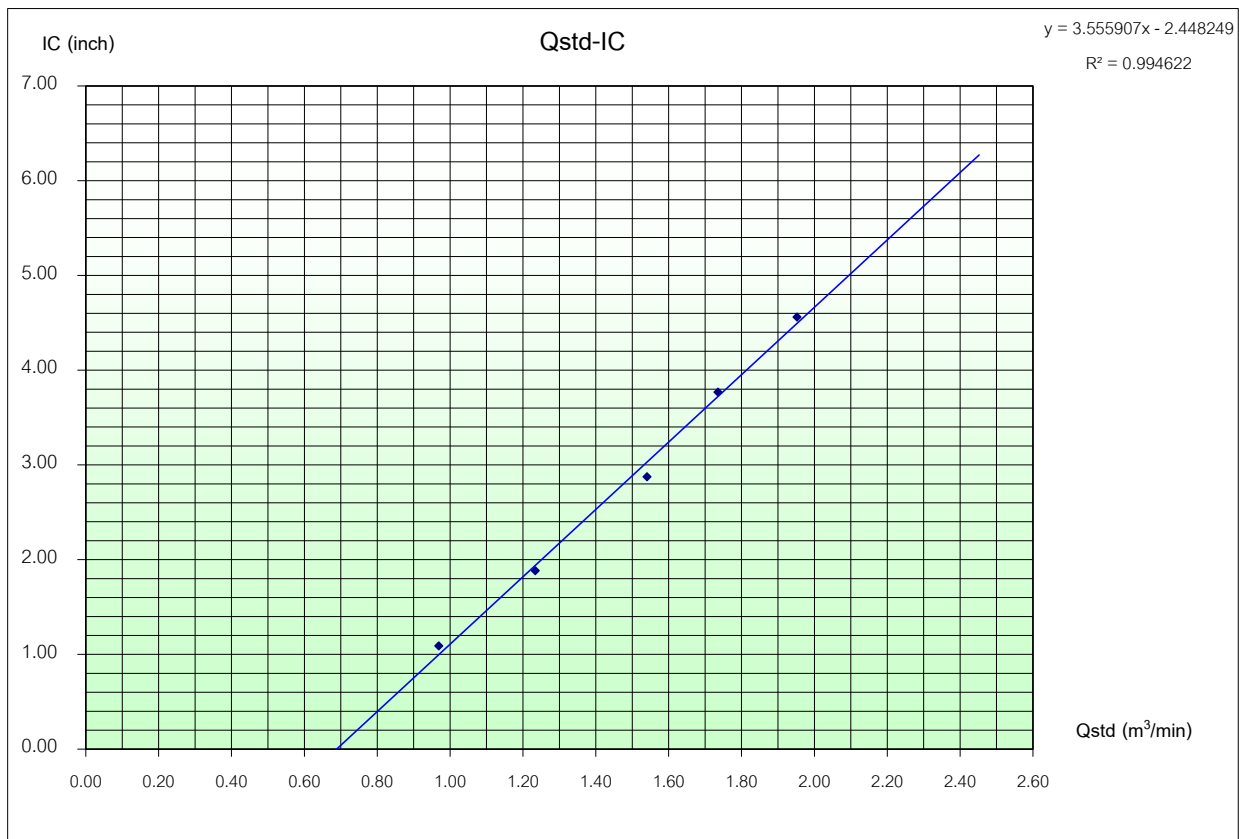
Plate No.	(Delta H)			(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter
	Pressure Drop Across Orifice (inH ₂ O)			$[\Delta H_2O(Pa/P_{std})(T_{std}/Ta)]^{1/2}$	$Q_{std} = (1/m)[(A-b)]$ (m ³ /min)	Sample Flow Rate Indication (inch)	$IC = [[(Pa/P_{std})(T_{std}/Ta)]^{1/2}]$	("K = °C+273)	(mmHg)		
	Positive	Negative	ΔH_2O								
5	1.8	1.8	3.6	1.88165	0.96889	1.1	1.09	303.0	760.0		
7	2.9	2.9	5.8	2.38837	1.23371	1.9	1.88	303.0	760.0		
10	4.5	4.5	9.0	2.97514	1.54037	2.9	2.88	303.0	760.0		
13	5.7	5.7	11.4	3.34841	1.73544	3.8	3.77	303.0	760.0		
18	7.2	7.2	14.4	3.76329	1.95227	4.6	4.56	303.0	760.0		

Linear Regression Y ON X : Y= mX + b

1	Slope (m)	1.91345	Linear Equation			r^2	0.950727	Pstd(mmHg)	760.0
2	Intercept (b)	0.02773	Set Point Flow Rate (X) (m ³ /min)	1.133		r	0.9750523	T _{NTP}	298.0
3	Correlation Coefficient (r)	0.99995	Final Set Flow Rate = (I)	0		(Pa/Pstd)*(Tstd/Ta)	0.98349835		
Result						C=(Pa/Pstd)*(Tstd/Ta)^0.5		0.991714853	

COMMENT

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TSP HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Sampler Location				Date	January 16, 2024
วัดศรีชุมพร (วัดบ้านน้ำจ้อย)				Start Time	9:00 AM
Sampler Number	TSP No.1	Transfer Standard Type	Orifice	Stop Time	9:05 AM
Motor Serial Number	BL-01	Calibrator Model	TE-5025A	Person	
Recorder Serial Number	-	Calibrator Serial Number	1		

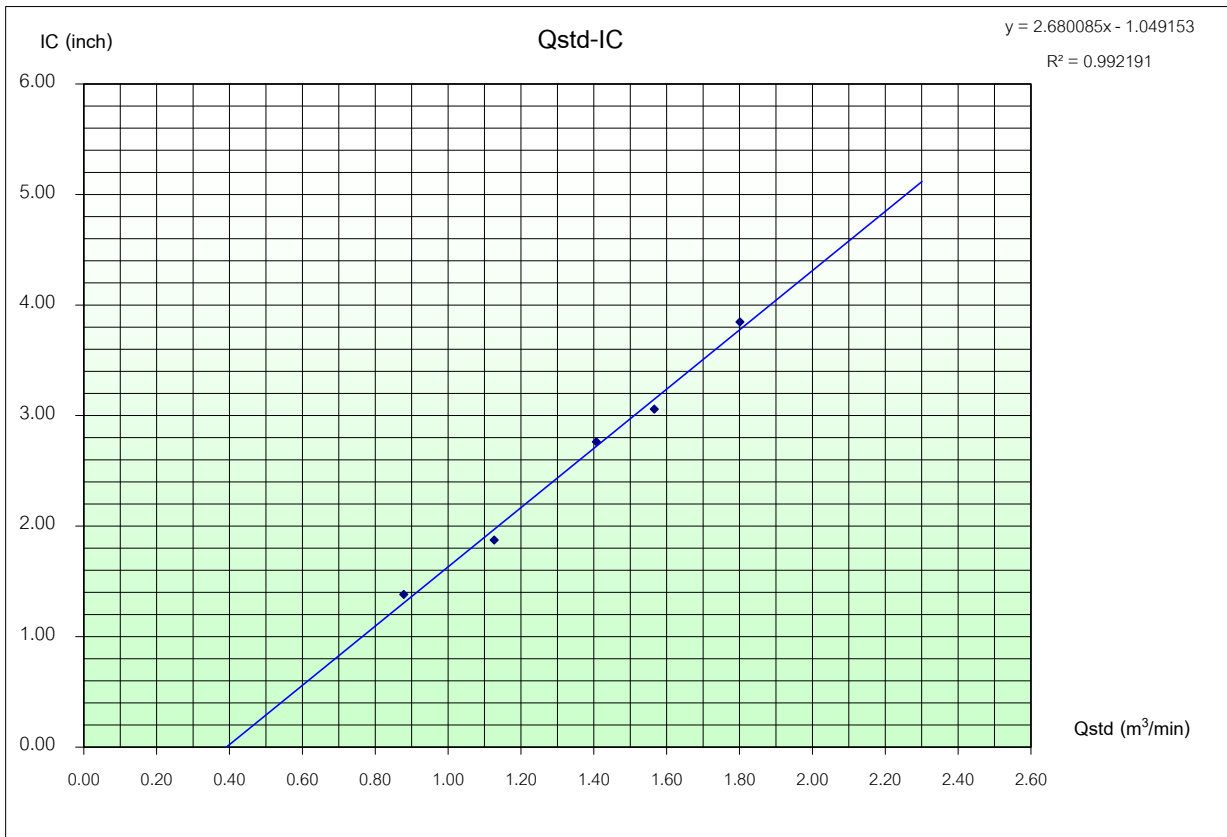
Plate No.	(Delta H)			(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter
	Pressure Drop Across Orifice (inH ₂ O)			$[\Delta H_2O(Pa/P_{std})(T_{std}/Ta)]^{1/2}$	Qstd = (1/m)[(A-b)] (m ³ /min)	Sample Flow Rate Indication (inch)	$IC = [[(Pa/P_{std})(T_{std}/Ta)]^{1/2}]$	("K = °C+273)	(mmHg)		
	Positive	Negative	ΔH ₂ O								
5	1.5	1.5	3.0	1.70868	0.87849	1.4	1.38	305.0	757.0		
7	2.4	2.5	4.9	2.18372	1.12676	1.9	1.87	305.0	757.0		
10	3.8	3.8	7.6	2.71961	1.40682	2.8	2.76	305.0	757.0		
13	4.7	4.7	9.4	3.02457	1.56620	3.1	3.06	305.0	757.0		
18	6.2	6.2	12.4	3.47384	1.80099	3.9	3.85	305.0	757.0		

Linear Regression Y ON X : Y= mX + b

1	Slope (m)	1.91345	Linear Equation			r^2	0.992314	Pstd(mmHg)	760.0
2	Intercept (b)	0.02773	Set Point Flow Rate (X) (m ³ /min)	1.133	r	0.9961496	T _{NTP}		298.0
3	Correlation Coefficient (r)	0.99995	Final Set Flow Rate = (I)	0	(Pa/Pstd)*(Tstd/Ta)			0.973192407	
Result						C=(Pa/Pstd)*(Tstd/Ta)^0.5		0.986505148	

COMMENT

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PM10 HIGH VOLUME AIR SAMPLER CALIBRATION REPORT

Sampler Location				Date	January 13, 2024
วัดศรีชุมพร (วัดบ้านน้ำจ้อย)				Start Time	1:15 PM
Sampler Number	PM-10 No.1	Transfer Standard Type	Orifice	Stop Time	1:20 PM
Motor Serial Number	HVL-01	Calibrator Model	TE-5025A	Person	
Recorder Serial Number	-	Calibrator Serial Number	1		

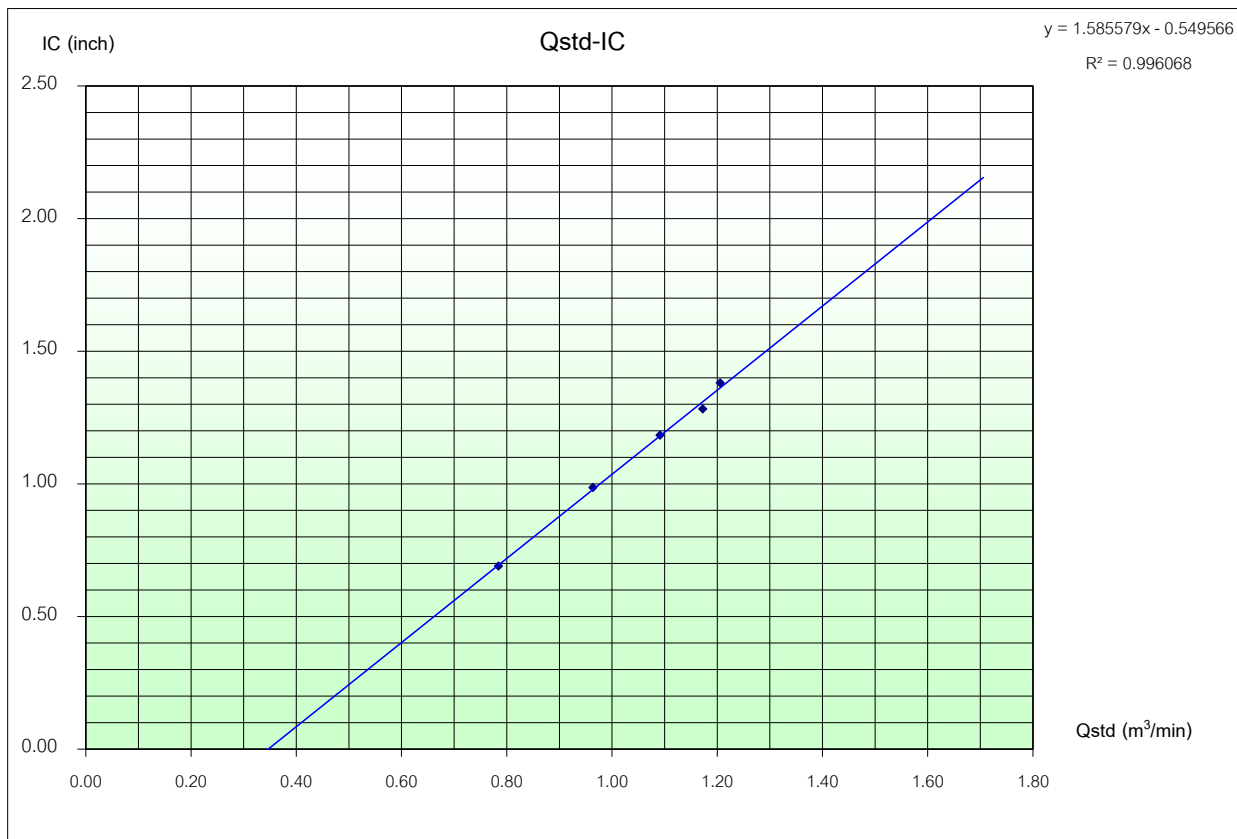
Plate No.	(Delta H)			(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter
	Pressure Drop Across Orifice (inH ₂ O)			$[\Delta H_2O(Pa/P_{std})(T_{std}/Ta)]^{1/2}$	$Q_{std} = (1/m)[(A-b)]$ (m ³ /min)	Sample Flow Rate Indicator (inch)	$IC = [[(Pa/P_{std})(T_{std}/Ta)]^{1/2}]$	("K = °C+273)	(mmHg)		
	Positive	Negative	ΔH_2O								
5	1.2	1.2	2.4	1.52829	0.78422	0.7	0.69	305.0	757.0		
7	1.8	1.8	3.6	1.87176	0.96372	1.0	0.99	305.0	757.0		
10	2.3	2.3	4.6	2.11582	1.09127	1.2	1.18	305.0	757.0		
13	2.6	2.7	5.3	2.27111	1.17242	1.3	1.28	305.0	757.0		
18	2.8	2.8	5.6	2.33450	1.20555	1.4	1.38	305.0	757.0		

Linear Regression Y ON X : Y= mX + b

1	Slope (m)	1.91345	Linear Equation			r^2	0.987743	Pstd(mmHg)	760.0
2	Intercept (b)	0.02773	Set Point Flow Rate (X) (m ³ /min)	1.133		r	0.9938526	T _{NTP}	298.0
3	Correlation Coefficient (r)	0.99995	Final Set Flow Rate = (I)	0		(Pa/Pstd)*(Tstd/Ta)		0.973192407	
Result						C=(Pa/Pstd)*(Tstd/Ta)^0.5		0.986505148	

COMMENT

Andersen Instruments, Inc.



Calibrated By

Field Environmental

Division Manager



บริษัท เอ็นไวร์ เซอร์วิส จำกัด
ENVIR SERVICE CO., LTD.

บริษัท เอ็นไวร์ เซอร์วิส จำกัด

42 รามอินทรา 14 แยก 9 แขวงท่าแร้ง เขตบางเขน กรุงเทพฯ 10230 โทรศัพท์ 02-9435814-5 โทรสาร 02-9438201

42 Raminthra 14 yeak 9, Tha Rang, Bangkhen, Bankok 10230 Tel : 02-9435814-5 Fax : 02-9438201

Analyzer Performance Test

Calibrated Date: 5 January

2024 Instruments Information

Analyzer Type: NO/NO2/NOx Analyzer Model: Serinus 40	Manufacturer ECOTECH S/N: 12-1001
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Calibration System

Calibrator Unit	Standard Gas
Dilutor Model Dasibi Model 5008 S/N: 705 ZERO AIR Generator API Model 701 S/N: 1924	NO Conc 55.47 PPM SO2 Conc 55.11 PPM CO Conc 4,535 PPM Cylinder number EB0129027 Expire Date: 29 Oct. 2027

Environment: Temperature 25.5 °C

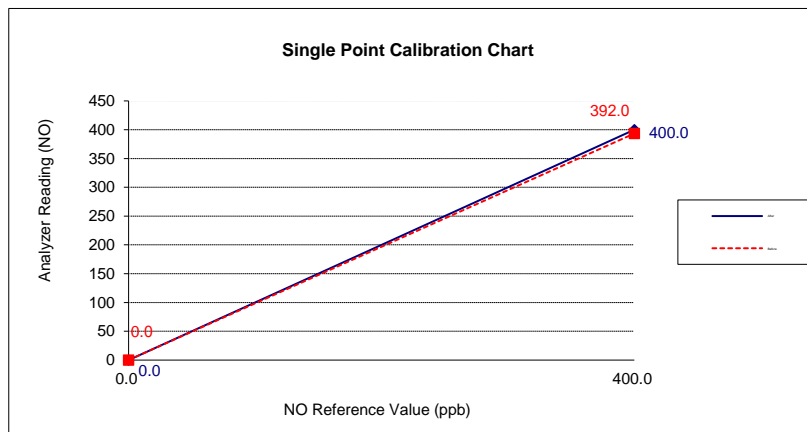
Humidity: 51 %RH

Calibration Check (Before adjust)

GAS	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift%
NO	0.0	0.0	0.0	392.0	400.0	-2.0
NOx	0.0	1.0	1.0	400.0	400.0	0.0

Calibration Check (After adjust)

GAS	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift%
NO	0.0	0.0	0.0	400.0	400.0	0.0
NOx	0.0	0.0	0.0	400.0	400.0	0.0



Calibrate By :



บริษัท เอ็นไวร์ เซอร์วิส จำกัด
ENVIR SERVICE CO., LTD.

บริษัท เอ็นไวร์ เซอร์วิส จำกัด

42 รามอินทรา 14 แยก 9 แขวงท่าแร้ง เขตบางเขน กรุงเทพฯ 10230 โทรศัพท์ 02-9435814-5 โทรสาร 02-9438201

42 Raminthra 14 yeak 9, Tha Rang, Bangkhen, Bankok 10230 Tel : 02-9435814-5 Fax : 02-9438201

Analyzer Performance Test

Calibrated Date: 5 April 2024

Instruments Information

Analyzer Type: NO/NO2/NOx Analyzer Model: 42C	Manufacturer Thermo Environmental S/N: 42C-601114783
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Calibration System

Calibrator Unit	Standard Gas
Dilutor Model Dasibi Model 5008 S/N: 705 ZERO AIR Generator API Model 701 S/N: 1924	NO Conc 55.47 PPM SO2 Conc 55.11 PPM CO Conc 4,535 PPM Cylinder number EB0129027 Expire Date: 29 Oct. 2027

Environment: Temperature 25.5 °C

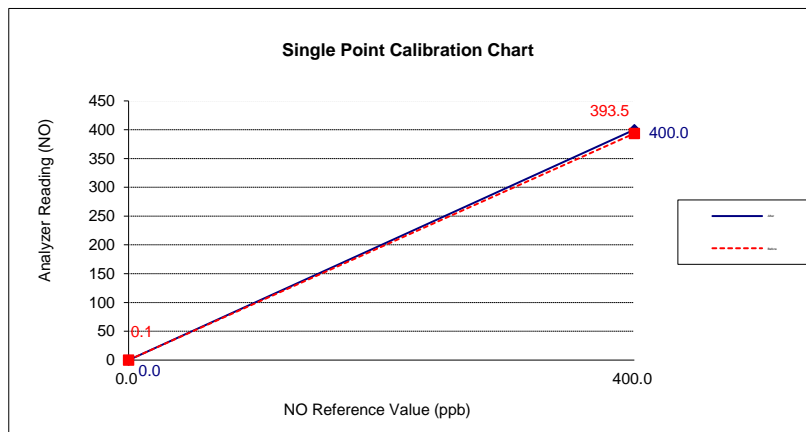
Humidity: 51 %RH

Calibration Check (Before adjust)

GAS	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift%
NO	0.1	0.0	0.1	393.5	400.0	-1.6
NOx	0.1	0.0	0.1	396.2	400.0	-1.0

Calibration Check (After adjust)

GAS	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift%
NO	0.0	0.0	0.0	400.0	400.0	0.0
NOx	0.0	0.0	0.0	400.0	400.0	0.0



Calibrate By :

CERTIFICATE OF CALIBRATION

NO. 20231215111

Name of Product:	Sound Level Meter
Model	ST-21D
Serial Number:	820791
Specification:	Class 2
Conclusion:	Pass
Date of calibration:	2023-12-14
Due Date:	2024-12-13

Calibrated by:

- I. This report certifies that all calibration equipment used in the test is traceable with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass then, and applies only to the unit identified above.
- II. This certificate is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
- III. This certificate of calibration shall not be reproduced except in full, without written permission of the Scarlet Tech Co Ltd Taiwan.

1. Preliminary inspection: OK

2. Type & serial No. of Microphone: AWA14421A-000378

3. Adjustments to indicated sound levels:

Type of Calibrator B&K 4231

Sound Pressure Level 94.0 dB

4. Measuring up limit: 138 dBA

5. Frequency weightings (Acoustic signal tests for Z weighting, other electric signal tests.)

Equivalent Free-field Sound Level (reference environment conditions) 93.8 dB

Nominal frequency /Hz	Frequency weighting / dB			Nominal frequency /Hz	Frequency weighting / dB		
	A	C	Z		A	C	Z
20	-50.4	-6.1	-0.2	1000	0.1	0.0	0.0
31.5	-39.4	-2.9	0.0	2000	1.3	-0.1	0.0
63	-26.2	-0.8	0.0	4000	1.3	-0.6	0.0
125	-16.1	-0.1	0.0	8000	-1.1	-3.1	0.1
250	-8.6	0.0	0.1	12500	-11.0	-13.0	0.0
500	-3.2	0.0	0.0	/	/	/	/

6. Self-generated noise

Microphone replaced by electrical input signal device

25.1 dB(A)	26.3 dB(C)	34.9 dB(Z)
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7. F&S Weighting

Rate of the F weighting decrease (dB/s)	34.6
Rate of the S weighting decrease (dB/s)	4.3
Deviation of F&S	-0.1

8. Level Linearity (A-weighting at frequency 1 kHz)

Reference sound level 90.0 dB

Max error at 10dB steps upper reference sound level 0.1 dB

Max error at 1dB steps within 5dB of the upper limit linear operating range 0.0 dB

Max error at 10dB steps below reference sound level 0.1 dB

Max error at 1dB steps within 5dB upper the lower limit linear operating range 0.1 dB

9. Tone burst response (A Weighting) :

Single Toneburst duration /ms	Toneburst response /dB			
	LAFmax-LA	LASmax-LA	LAE-LA	LAeqT-LA
500	0.0	-4.0	-2.9	-7.0
200	-1.0	-16.9	-6.9	-7.0
2	-18.2	-26.9	-26.9	-7.0
0.25	-27.1	/	-36.1	-7.0

10. Peak C sound level (500Hz) :

Cycle	One cycle	nominal value	Positive half	nominal value	Negative half	nominal value
LCpeak-LC(dB)	3.4	3.5	2.3	2.4	2.3	2.4

11. Overload indication: Pass

12. Statistical analysis function

Sweep signal maximum indicated sound level: 123.0 dB

Sweep amplitude: 40 dB

Scan cycle time: 60 S; Measurement period: 180 S.

Items	Measured value/dB	Theoretical calculated value/dB	Error/dB
L_{Aeq,T}	113.3	113.4	-0.1
L₅	121.0	121.0	0.0
L₁₀	119.0	119.0	0.0
L₅₀	103.0	103.0	0.0
L₉₀	87.1	87.0	0.1
L₉₅	85.1	85.0	0.1

Uncertainty of measurement results: 0.4 dB (k=2)

Environment conditions:

Air temperature: 20 °C

Relative humidity: 50 %

Static pressure: 101.8 kPa

Test specifications:

1. All Scarlet's Sound level Meter has been calibrated in accordance with the requirements as specified in ISO 17025 and the lab calibration procedure SMTP004-CA-152.
2. The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
3. The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responses of the Sound Level Meter.

References:

IEC 61672-3 Sound Level Meters Part 3: Periodic tests

CERTIFICATE OF CALIBRATION

NO. 20231215112

Name of Product:	Sound Level Meter
Model	ST-21D
Serial Number:	820792
Specification:	Class 2
Conclusion:	Pass
Date of calibration:	2023-12-14
Due Date:	2024-12-13

Calibrated by:

- I. This report certifies that all calibration equipment used in the test is traceable with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass then, and applies only to the unit identified above.
- II. This certificate is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
- III. This certificate of calibration shall not be reproduced except in full, without written permission of the Scarlet Tech Co Ltd Taiwan.

1. Preliminary inspection: OK

2. Type & serial No. of Microphone: AWA14421A-000433

3. Adjustments to indicated sound levels:

Type of Calibrator B&K 4231

Sound Pressure Level 94.0 dB

4. Measuring up limit: 138 dBA

5. Frequency weightings (Acoustic signal tests for Z weighting, other electric signal tests.)

Equivalent Free-field Sound Level (reference environment conditions) 93.8 dB

Nominal frequency /Hz	Frequency weighting / dB			Nominal frequency /Hz	Frequency weighting / dB		
	A	C	Z		A	C	Z
20	-50.6	-6.3	-0.3	1000	0.1	0.0	0.0
31.5	-39.5	-3.0	-0.1	2000	1.3	-0.1	0.0
63	-26.2	-0.9	0.0	4000	1.3	-0.6	0.0
125	-16.2	-0.2	0.0	8000	-1.2	-3.2	0.1
250	-8.6	0.0	0.1	12500	-11.0	-13.0	0.0
500	-3.2	0.0	0.0	/	/	/	/

6. Self-generated noise

Microphone replaced by electrical input signal device

25.2 dB(A)	26.0 dB(C)	34.3 dB(Z)
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7. F&S Weighting

Rate of the F weighting decrease (dB/s)	35.2
Rate of the S weighting decrease (dB/s)	4.4
Deviation of F&S	0.0

8. Level Linearity (A-weighting at frequency 1 kHz)

Reference sound level 90.0 dB

Max error at 10dB steps upper reference sound level 0.1 dB

Max error at 1dB steps within 5dB of the upper limit linear operating range 0.0 dB

Max error at 10dB steps below reference sound level 0.1 dB

Max error at 1dB steps within 5dB upper the lower limit linear operating range 0.1 dB

9. Tone burst response (A Weighting) :

Single Toneburst duration /ms	Toneburst response /dB			
	LAFmax-LA	LASmax-LA	LAE-LA	LAeqT-LA
500	0.0	-4.0	-2.9	-7.0
200	-1.0	-7.4	-6.9	-7.0
2	-18.2	-26.9	-26.9	-7.0
0.25	-27.3	/	-36.1	-7.0

10. Peak C sound level (500Hz) :

Cycle	One cycle	nominal value	Positive half	nominal value	Negative half	nominal value
LCpeak-LC(dB)	3.5	3.5	2.3	2.4	2.3	2.4

11. Overload indication: Pass

12. Statistical analysis function

Sweep signal maximum indicated sound level: 123.0 dB

Sweep amplitude: 40 dB

Scan cycle time: 60 S; Measurement period: 180 S.

Items	Measured value/dB	Theoretical calculated value/dB	Error/dB
L_{Aeq,T}	113.3	113.4	-0.1
L₅	121.0	121.0	0.0
L₁₀	119.0	119.0	0.0
L₅₀	103.0	103.0	0.0
L₉₀	87.1	87.0	0.1
L₉₅	85.1	85.0	0.1

Uncertainty of measurement results: 0.4 dB (k=2)

Environment conditions:

Air temperature: 20 °C

Relative humidity: 50 %

Static pressure: 101.8 kPa

Test specifications:

1. All Scarlet's Sound level Meter has been calibrated in accordance with the requirements as specified in ISO 17025 and the lab calibration procedure SMTP004-CA-152.
2. The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
3. The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responses of the Sound Level Meter.

References:

IEC 61672-3 Sound Level Meters Part 3: Periodic tests

CERTIFICATE OF CALIBRATION

NO. 20231215113

Name of Product:	Sound Level Meter
Model	ST-21D
Serial Number:	820793
Specification:	Class 2
Conclusion:	Pass
Date of calibration:	2023-12-14
Due Date:	2024-12-13

Calibrated by:

- I. This report certifies that all calibration equipment used in the test is traceable with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass then, and applies only to the unit identified above.
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- III. This certificate of calibration shall not be reproduced except in full, without written permission of the Scarlet Tech Co Ltd Taiwan.

1. Preliminary inspection: OK

2. Type & serial No. of Microphone: AWA14421A-000482

3. Adjustments to indicated sound levels:

Type of Calibrator B&K 4231

Sound Pressure Level 94.0 dB

4. Measuring up limit: 138 dBA

5. Frequency weightings (Acoustic signal tests for Z weighting, other electric signal tests.)

Equivalent Free-field Sound Level (reference environment conditions) 93.8 dB

Nominal frequency /Hz	Frequency weighting / dB			Nominal frequency /Hz	Frequency weighting / dB		
	A	C	Z		A	C	Z
20	-50.4	-6.4	-0.2	1000	0.1	0.0	0.0
31.5	-39.6	-3.1	-0.2	2000	1.3	-0.1	0.0
63	-26.2	-0.8	0.0	4000	1.3	-0.6	0.0
125	-16.2	-0.3	0.0	8000	-1.2	-3.2	0.1
250	-8.6	0.0	0.1	12500	-11.0	-13.0	0.0
500	-3.2	0.0	0.0	/	/	/	/

6. Self-generated noise

Microphone replaced by electrical input signal device

24.8 dB(A)	25.6 dB(C)	34.4 dB(Z)
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7. F&S Weighting

Rate of the F weighting decrease (dB/s)	35.2
Rate of the S weighting decrease (dB/s)	4.4
Deviation of F&S	-0.1

8. Level Linearity (A-weighting at frequency 1 kHz)

Reference sound level 90.0 dB

Max error at 10dB steps upper reference sound level 0.1 dB

Max error at 1dB steps within 5dB of the upper limit linear operating range 0.0 dB

Max error at 10dB steps below reference sound level 0.1 dB

Max error at 1dB steps within 5dB upper the lower limit linear operating range 0.1 dB

9. Tone burst response (A Weighting) :

Single Toneburst duration /ms	Toneburst response /dB			
	LAFmax-LA	LASmax-LA	LAE-LA	LAeqT-LA
500	0.0	-4.0	-2.9	-7.0
200	-1.0	-7.4	-6.9	-7.0
2	-18.2	-26.9	-26.9	-7.0
0.25	-27.2	/	-36.1	-7.0

10. Peak C sound level (500Hz) :

Cycle	One cycle	nominal value	Positive half	nominal value	Negative half	nominal value
LCpeak-LC(dB)	3.5	3.5	2.3	2.4	2.3	2.4

11. Overload indication: Pass

12. Statistical analysis function

Sweep signal maximum indicated sound level: 123.0 dB

Sweep amplitude: 40 dB

Scan cycle time: 60 S; Measurement period: 180 S.

Items	Measured value/dB	Theoretical calculated value/dB	Error/dB
L _{Aeq,T}	113.3	113.4	-0.1
L ₅	121.0	121.0	0.0
L ₁₀	119.0	119.0	0.0
L ₅₀	103.0	103.0	0.0
L ₉₀	87.1	87.0	0.1
L ₉₅	85.1	85.0	0.1

Uncertainty of measurement results: 0.4 dB (k=2)

Environment conditions:

Air temperature: 20 °C

Relative humidity: 50 %

Static pressure: 101.8 kPa

Test specifications:

1. All Scarlet's Sound level Meter has been calibrated in accordance with the requirements as specified in ISO 17025 and the lab calibration procedure SMTP004-CA-152.
2. The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
3. The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responses of the Sound Level Meter.

References:

IEC 61672-3 Sound Level Meters Part 3: Periodic tests

Calibration & Test Certificate

We hereby certify that the instrument under mentioned has been certainly calibrated according to our calibration standard and the testing result in the calibration procedure has been good enough within the tolerance regulated in our specification.

Test conditions

Model name Noise Dosimeter
Model number..... ST-130
Serial number 230600019
Temperature 25.0° C
Humidity..... 77.0%rh
Date of calibration 2023/09/08
Valid Until..... 2024/09/07

Test data

Test Item	Range	Results
M dBA	Range: 30...130 dB	PASS
M dBC	Range: 30...130 dB	PASS
M dBZ	Range: 30...130 dB	PASS

Calibrator

Model	Model number	Serial number	Due date
Standard SOUND LEVEL METER	B&K 2239	2449143	OCT/22/2024

The standard generators used for calibration procedure are proofed once a year and can be traceable to the standard authorized by public organization.

Approved by



Scarlet Tech
Head of Engineering Department

Calibration & Test Certificate

We hereby certify that the instrument under mentioned has been certainly calibrated according to our calibration standard and the testing result in the calibration procedure has been good enough within the tolerance regulated in our specification.

Test conditions

Model name Noise Dosimeter
 Model number..... ST-130
 Serial number 230600020
 Temperature 25.0° C
 Humidity..... 77.0%rh
 Date of calibration 2023/09/08
 Valid Until..... 2024/09/07

Test data

Test Item	Range	Results
M dBA	Range: 30...130 dB	PASS
M dBC	Range: 30...130 dB	PASS
M dBZ	Range: 30...130 dB	PASS

Calibrator

Model	Model number	Serial number	Due date
Standard SOUND LEVEL METER	B&K 2239	2449143	OCT/22/2024

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Approved by



Scarlet Tech
Head of Engineering Department

Calibration & Test Certificate

We hereby certify that the instrument under mentioned has been certainly calibrated according to our calibration standard and the testing result in the calibration procedure has been good enough within the tolerance regulated in our specification.

Test conditions

Model name Noise Dosimeter
Model number..... ST-130
Serial number 230600121
Temperature 22.0° C
Humidity..... 70.0%rh
Date of calibration 2023/10/18
Valid Until..... 2024/10/17

Test data

Test Item	Range	Results
M dBA	Range: 30... 130 dB	PASS
M dBC	Range: 30... 130 dB	PASS
M dBZ	Range: 30... 130 dB	PASS

Calibrator

Model	Model number	Serial number	Due date
Standard SOUND LEVEL METER	B&K 2239	2449143	OCT/22/2024

The standard generators used for calibration procedure are proofed once a year and can be traceable to the standard authorized by public organization.

Approved by _____



Scarlet Tech
Head of Engineering Department

Calibration & Test Certificate

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Test conditions

Model name Noise Dosimeter
Model number..... ST-130
Serial number 230600122
Temperature 22.0° C
Humidity..... 70.0%rh
Date of calibration 2023/10/18
Valid Until..... 2024/10/17

Test data

Test Item	Range	Results
M dBA	Range: 30...130 dB	PASS
M dBC	Range: 30...130 dB	PASS
M dBZ	Range: 30...130 dB	PASS

Calibrator

Model	Model number	Serial number	Due date
Standard SOUND LEVEL METER	B&K 2239	2449143	OCT/22/2024

The standard generators used for calibration procedure are proofed once a year and can be traceable to the standard authorized by public organization.

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Scarlet Tech
Head of Engineering Department