

**TSP HIGH VOLUME AIR SAMPLER CALIBRATION REPORT**

<b>Customer</b>	Envir Service Co.,Ltd.			<b>Date</b>	January 22, 2026
<b>Address</b>	42 Raminthra 14 Yeak 9, Tha Raeng, Bangkok 10230			<b>Start Time</b>	9:00 AM
Sampler Number	TSP No.1	Transfer Standard Type	Orifice	<b>Stop Time</b>	9:25 AM
Motor Serial Number	TSP No.1	Calibrator Model	25A	<b>Person</b>	Mr.Pasagorn Samol
Recorder Serial Number	-	Calibrator Serial Number	307N		

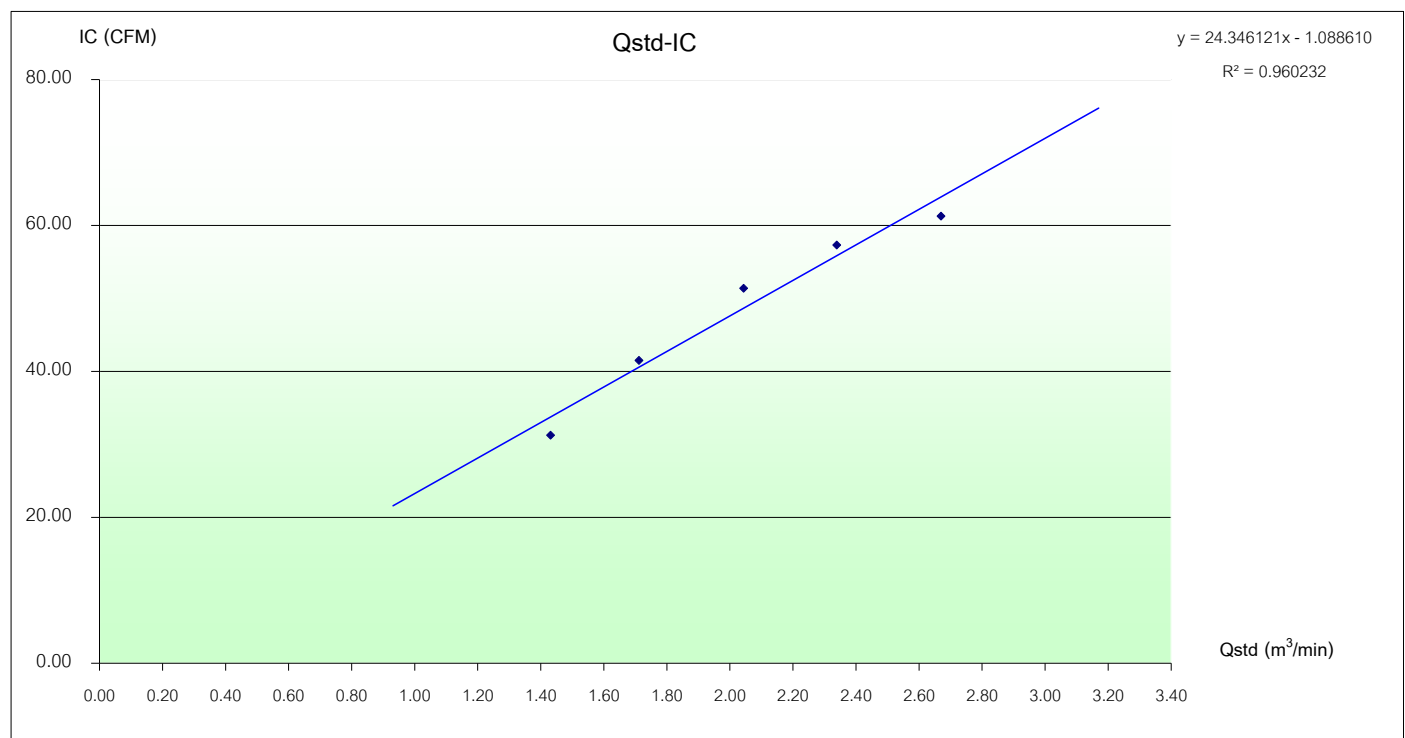
**Calibration Orifice**


Manufacture:	Graseby GMW	Qstd Slope:	1.29243
Model:	25A	Qstd Intercept:	-0.01962
Serial#:	307N	Calibration Date:	14-Dec-26

Plate No.	(Delta H)			(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter
	Positive	Negative	$\Delta H_2O$	$[\Delta H_2O(Pa/P_{std})(T_{std}/T_a)]^{1/2}$	Qstd = $(1/m)[(A-b)]$ (m <sup>3</sup> /min)	Sample Flow Rate Indication (ft <sup>3</sup> /min)	IC = $1/[(Pa/P_{std})(T_{std}/T_a)]^{1/2}$	(°K = °C+273)	(mmHg)		
5	1.9	1.8	8.7	2.92194	1.43126	32.0	31.26	305.0	760.0	10:40	-
7	2.8	2.7	12.5	3.49997	1.71138	42.0	41.51	305.1	760.0	-	-
10	4.0	3.9	17.9	4.18510	2.04340	52.0	51.39	305.0	760.0	-	-
13	5.3	5.2	23.5	4.79533	2.33912	58.0	57.32	305.1	760.0	-	-
18	6.4	6.3	30.7	5.47805	2.66997	62.0	61.28	305.1	760.0	-	10:35

Linear Regression Y ON X : Y= mX + b

1	Slope ( m )	2.0635	Linear Equation		Average	305.1	760.0		
2	Intercept( b )	-0.03151	Set Point Flow Rate ( X ) (m <sup>3</sup> /min)		r <sup>2</sup>	0.982631	0.982631	Pstd(mmHg)	760.0
3	Correlation Coefficient ( r )	0.99993	Final Set Flow Rate = ( I )		r	0.99127746	T <sub>NTP</sub>		298.0
<b>Result</b>					0	(Pa/Pstd)*(Tstd/Ta)			0.976857012
						C=(Pa/Pstd)*(Tstd/Ta)^0.5			0.98836077



Calibrate By :   
MR. KITTISAK JANSANGWATTANA

Approve by :   
MR. PASAGORN SAMOL

**PM10 HIGH VOLUME AIR SAMPLER CALIBRATION REPORT**

Customer	ENVIR SERVICE CO., LTD.			Date	January 21, 2026
Address	42 Ramintra 14 Yeak 9, Tha Raeng, Bang Khen, Bangkok 10230			Start Time	2:30 PM
Sampler Number	PM10 No.1	Transfer Standard Type	Orifice	Stop Time	2:55 PM
Motor Serial Number	PM10 No.1	Calibrator Model	25A	Person	Mr.Pasagorn Samol
Recorder Serial Number	-	Calibrator Serial Number	307N		

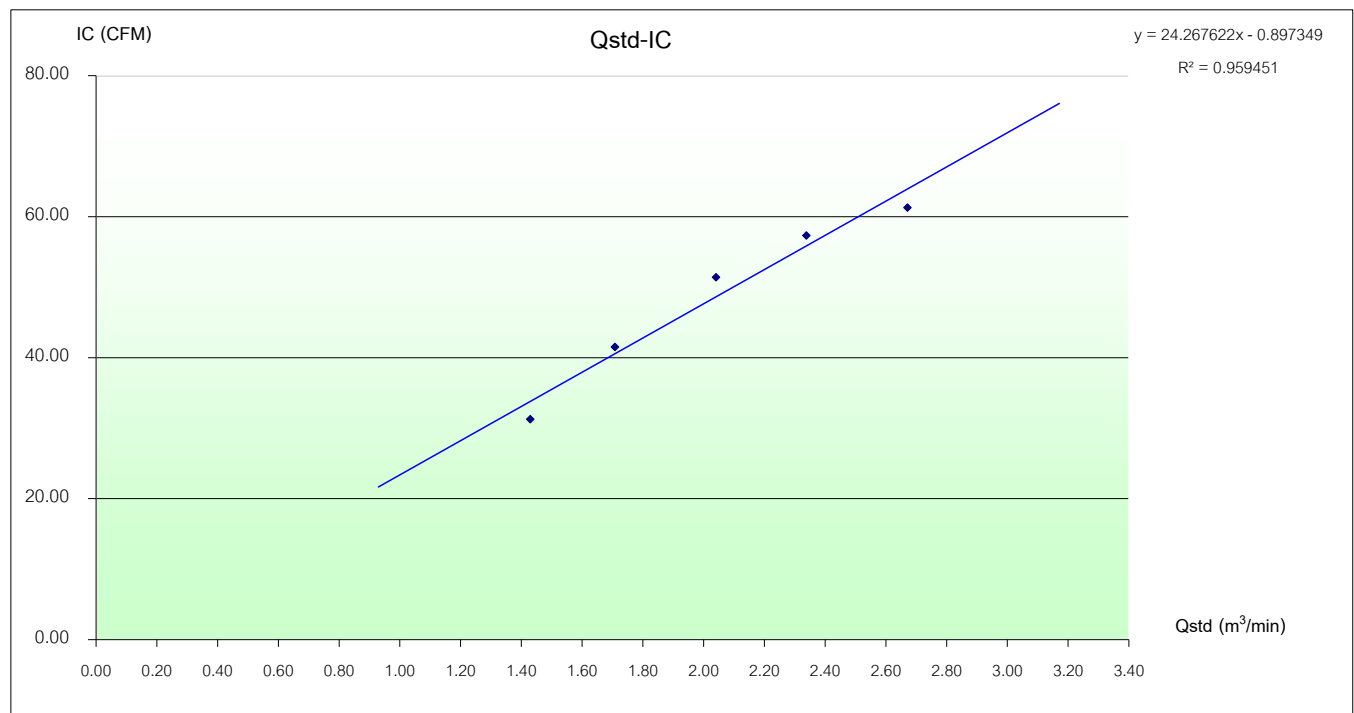
**Calibration Orifice**


Manufacture:	Graseby GMW	Qstd Slope:	1.29243
Model:	25A	Qstd Intercept:	-0.01962
Serial#:	307N	Calibration Date:	14-Dec-26


Plate No.	(Delta H)			(A)	(X)	(I)	(Y)	Temperature	Barometric Pressure	Start Meter	Stop Meter
	Positive	Negative	$\Delta H_2O$	$[\Delta H_2O(Pa/P_{std})(T_{std}/T_a)]^{1/2}$	$Q_{std} = (I/m)[(A-b)]$ (m <sup>3</sup> /min)	Sample Flow Rate Indication (ft <sup>3</sup> /min)	$IC = I[[(P_a/P_{std})(T_{std}/T_a)]^{1/2}]$	(°K = °C+273)	(mmHg)		
5	1.9	1.8	8.7	2.91850	1.42959	32.0	31.26	305.0	760.0	9:30	-
7	2.8	2.7	12.5	3.49287	1.70794	42.0	41.51	305.1	760.0	-	-
10	4.0	3.9	17.9	4.18029	2.04107	52.0	51.39	305.0	760.0	-	-
13	5.3	5.2	23.5	4.79416	2.33855	58.0	57.32	305.1	760.0	-	-
18	6.4	6.3	30.8	5.48055	2.67118	62.0	61.28	305.2	760.0	-	9:55

Linear Regression Y ON X : Y= mX + b

1	Slope ( m )	2.0635	Linear Equation		$r^2$	0.982631	Pstd(mmHg)	760.0
2	Intercept( b )	-0.03151	Set Point Flow Rate ( X ) (m <sup>3</sup> /min)		r	0.99127746	T <sub>NTP</sub>	298.0
3	Correlation Coefficient ( r )	0.99993	Final Set Flow Rate = ( I )		0	(Pa/Pstd)*(Tstd/Ta)		0.976792972
Result							C=(Pa/Pstd)*(Tstd/Ta)^0.5	0.988328373



Calibrate By:   
MR. KITTISAK JANSANGWATTANA

Approve by:   
MR. PASAGORN SAMOL



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, Bangkok 10230 Tel : 02-9435814-5 Fax : 02-9438201

### Analyzer Performance Test

Calibrated Date: 22 April 2022

#### Instruments Information

Analyzer Type: CO Analyzer Model: 48C	Manufacturer Thermo Environmental S/N: 0604815182
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#### Calibration System

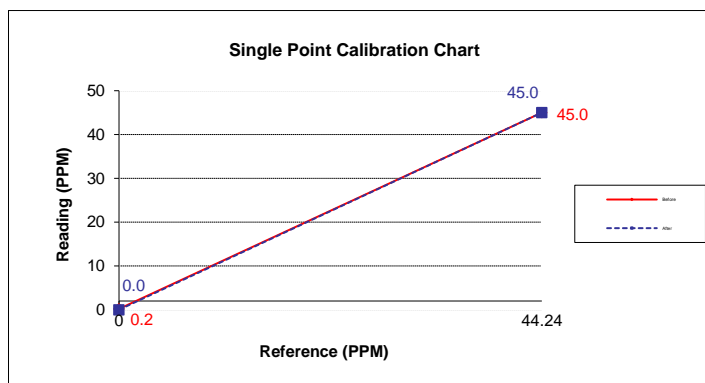
Calibrator Unit	Standard Gas
Dilutor Model Dasibi Model 5008 S/N: 705 ZERO AIR Generator API MODEL 701 S/N: 1924	NO Conc 55.47 PPM SO2 Conc 55.11 PPM CO Conc 4,535 PPM Cylinder number EB0129027 Expire Date: 29 Oct. 2027

Environment: Temperature 25.5 °C

Humidity: 51 %RH

#### Calibration Report

Status	Zero			Span		
	Reference (PPM)	Reading (PPM)	Drift (PPM)	Reference (PPM)	Reading (PPM)	Drift%
Before	0.0	0.2	0.2	44.2	45.0	1.7
After	0.0	0.0	0.0	45.0	45.0	0.0



Calibrate By :

Mr. PASAGORN SAMOL

## CERTIFICATE OF CALIBRATION

NO. 20250429185

Name of Product: Sound Level Meter  
Model: ST-21D  
Serial Number: 821165  
Specification: Class 2  
Conclusion: Pass  
Date of calibration: 2025-07-21  
Due Date: 2026-07-20



Calibrated by: *[Signature]*

- 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-001099

3. Adjustments to indicated sound levels:

Type of Calibrator: B&K 4231

Sound Pressure Level: 94.0 dB

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

4. Measuring up limit: 138 dBA

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

Nominal frequency /Hz	Frequency weighting / dB			Nominal frequency /Hz	Frequency weighting / dB		
	A	C	Z		A	C	Z
20	-50.3	-6.1	-0.2	1000	0.1	0.0	0.1
31.5	-39.4	-3.1	0.0	2000	1.3	-0.1	0.0
63	-26.2	-0.8	0.0	4000	1.3	-0.6	0.1
125	-16.2	-0.2	0.0	8000	-1.2	-3.1	0.1
250	-8.6	0.0	0.0	12500	-11.0	-13.0	0.1
500	-3.2	0.1	0.1	/	/	/	/



## 6. Self-generated noise

Microphone replaced by electrical input signal device

27.2 dB(A)	29.3 dB(C)	38.3 dB(Z)
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## 7. F&S Weighting

Rate of the F weighting decrease (dB/s)	35.0
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	LAeq-LA
500	0.0	-4.0	-2.9	-6.9
200	-1.0	-16.9	-6.9	-6.9
2	-17.9	-26.9	-26.9	-6.9
0.25	-27.2	/	-36.0	-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	2.4	2.4	2.4	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 <sub>Aeq,T</sub>	113.3	113.4	-0.1
L <sub>5</sub>	121.0	121.0	0.0
L <sub>10</sub>	119.0	119.0	0.0
L <sub>50</sub>	103.0	103.0	0.0
L <sub>90</sub>	87.1	87.0	0.1
L <sub>95</sub>	85.1	85.0	0.1

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

**Environment conditions:**

Air temperature: 27 °C

Relative humidity: 59 %

Static pressure: 102.0 kPa

**References:**

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



# Calibration Certificate

Part Number: 721A2601

Description: Micromate with DIN Geophone

Serial Number: UM16052

Calibration Date: NOV 30 2021

Calibration Reference Equipment: SRV-AFR 714J7401

*Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.*

*Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.*

*The environment in which this product was calibrated is maintained within the operating specifications of the instrument.*

*Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.*

Calibrated By: \_\_\_\_\_



Xiaoming Yang



**Instantel®**

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## Frequency Response of UM16052

