

ภาคผนวกที่ 5
เอกสารสอบเทียบเครื่องมือตรวจวัด

ภาคผนวกที่ 5-1
เอกสารสอบเทียบเครื่องมือตรวจวัดคุณภาพอากาศ



JIRANATEE ASSOCIATES CO.,LTD.

Jiranatee Associates Co.,Ltd.
63/14-15, 67/35-36
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Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Flow measurement laboratory
Calibration services department.



NSC – TISI – TIS 17025
CALIBRATION 0367

CERTIFICATE OF CALIBRATION

Certificate No. : COF-016-68

Page 1 of 2 Pages

MEASUREMENT ITEM : Top Load Orifice
MANUFACTURER : TISCH
MODEL/TYPE : TE-5025A
SERIAL NUMBER : 710725
ID NUMBER : -
CONDITION AS-RECEIVED : Used item
CUSTOMER : Pacific Laboratory Co., Ltd.
14/5358 Moo14, T.Bang Bua Thong, A.Bang Bua Thong,
Nonthaburi 11110, Thailand.

RECEIVED DATE : 02 May 2025
MEASUREMENT DATE : 13 May 2025
ISSUE DATE : 13 May 2025

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH
Atmospheric Pressure	: 1010 ± 10	hPa

CALIBRATION CONDITION:

Preconditioning : 24 hours at ambient conditions.
Measurement Condition : The average values during measurement are 23.3 °C and 53.1 %RH.

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibration procedure:

The Orifice gas flow device was calibrated against Standard Rotary Displacement Meter (Roots Meter) Model G65/IMC/W2-dp. The WI-CL-004 was used as a calibration guideline.

Traceability:

This certificate provides a traceability of the measurement to recognized the national standards, and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: MW-0016-25.

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor $k=2$, Which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM 'Evaluation of measurement data - Guide to the expression of uncertainty in measurement'

Calibrated by:

- ☐ Mr. Sorawit Thachalad
☒ Miss Jittraporn Lertsomphol



Approved signatory:

Mr. Parinya Booncharoen
Calibration Department Manager

MEASUREMENT RESULTS:

The Orifice gas flow device was calibrated by direct comparison method with the Standard Rotary Displacement Meter (Roots Meter). The Humid air was used as a medium in the system. The standard conditions are 25°C (298.15 K) and 760 mmHg for standard temperature and standard pressure respectively.

Table 1: The results of Q Standard calibration data

Plate	Flow rate m^3/min	Pressure [Pa] mmHg	Temperature [Ta] °C	Temperature [Tm] °C	Δp_{meter} mmHg	$\Delta p_{Orifice}$ inH ₂ O	γ	Standard Flow [Q_s] m^3/min
1	0.706	753.337	23.01	22.02	50.559	1.718	1.309	0.659
2	0.999	753.260	23.23	22.54	63.590	3.318	1.819	0.914
3	1.119	753.236	23.25	22.52	43.489	4.417	2.098	1.054
4	1.168	753.147	23.32	22.75	32.399	4.968	2.225	1.116
5	1.411	753.149	23.33	22.84	29.194	7.361	2.708	1.354

Slope (m): 2.01373
 Intercept (b): -0.02108
 Correlation coefficient (r): 0.99983
 Uncertainty ($k=2$): 0.015 m^3/min

Table 2: The results of Q actual calibration data

Plate	Flow rate m^3/min	Pressure [Pa] mmHg	Temperature [Ta] °C	Temperature [Tm] °C	Δp_{meter} mmHg	$\Delta p_{Orifice}$ inH ₂ O	γ	Standard Flow [Q_a] m^3/min
1	0.706	753.337	23.01	22.02	50.559	1.718	0.822	0.661
2	0.999	753.260	23.23	22.54	63.590	3.318	1.143	0.917
3	1.119	753.236	23.25	22.52	43.489	4.417	1.318	1.057
4	1.168	753.147	23.32	22.75	32.399	4.968	1.398	1.120
5	1.411	753.149	23.33	22.84	29.194	7.361	1.702	1.358

Slope (m): 1.26127
 Intercept (b): -0.01323
 Correlation coefficient (r): 0.99983
 Uncertainty ($k = 2$): 0.015 m^3/min

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Certificate No. : COF-016-69

Page 1 of 2 Pages

MEASUREMENT ITEM : Top Load Orifice
MANUFACTURER : TISCH
MODEL/TYPE : TE-5025A
SERIAL NUMBER : 710725
ID NUMBER : -
CONDITION AS-RECEIVED : Used item
CUSTOMER : Pacific Laboratory Co., Ltd.
14/5358 Moo14, T.Bang Bua Thong, A.Bang Bua Thong,
Nonthaburi 11110, Thailand.

RECEIVED DATE : 23 Apr 2026
MEASUREMENT DATE : 08 May 2026
ISSUE DATE : 08 May 2026

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH
Atmospheric Pressure	: 1010 ± 10	hPa

CALIBRATION CONDITION:

Preconditioning : 24 hours at ambient conditions.
Measurement Condition : The average values during measurement are 23.6 °C and 48.5 %RH.

Calibration procedure:

The Orifice gas flow device was calibrated against Standard Rotary Displacement Meter (Roots Meter) Model G65/IMC/W2-dp. The WI-CL-004 was used as a calibration guideline.

Traceability:

This certificate provides a traceability of the measurement to recognized the national standards, and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: MW-0005-26.

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor $k=2$, Which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM 'Evaluation of measurement data - Guide to the expression of uncertainty in measurement'

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

- ☐ Mr. Sorawit Thachalad
☒ Miss Jitraporn Lertsomphol



Approved signatory:

Mr. Parinya Booncharoen
Calibration Department Manager

MEASUREMENT RESULTS:

The Orifice gas flow device was calibrated by direct comparison method with the Standard Rotary Displacement Meter (Roots Meter). The Humid air was used as a medium in the system. The standard conditions are 25°C (298.15 K) and 760 mmHg for standard temperature and standard pressure respectively.

Table 1: The results of Q Standard calibration data

Plate	Flow rate m ³ /min	Pressure [Pa] mmHg	Temperature [Ta] °C	Temperature [Tm] °C	Δp_{meter} mmHg	$\Delta p_{\text{Orifice}}$ inH ₂ O	γ	Standard Flow [Q_s] m ³ /min
1	0.704	757.012	23.43	22.38	50.466	1.715	1.311	0.660
2	1.003	757.047	23.41	22.53	64.191	3.348	1.831	0.922
3	1.120	757.035	23.49	22.83	43.710	4.437	2.108	1.059
4	1.170	757.041	23.48	22.89	32.530	4.993	2.236	1.123
5	1.416	757.025	23.47	22.91	29.618	7.447	2.731	1.365

Slope (m): 2.01326
 Intercept (b): -0.02225
 Correlation coefficient (r): 0.99984
 Uncertainty ($k=2$): 0.015 m³/min

Table 2: The results of Q actual calibration data

Plate	Flow rate m ³ /min	Pressure [Pa] mmHg	Temperature [Ta] °C	Temperature [Tm] °C	Δp_{meter} mmHg	$\Delta p_{\text{Orifice}}$ inH ₂ O	γ	Standard Flow [Q_a] m ³ /min
1	0.704	757.012	23.43	22.38	50.466	1.715	0.820	0.659
2	1.003	757.047	23.41	22.53	64.191	3.348	1.145	0.920
3	1.120	757.035	23.49	22.83	43.710	4.437	1.319	1.058
4	1.170	757.041	23.48	22.89	32.530	4.993	1.399	1.122
5	1.416	757.025	23.47	22.91	29.618	7.447	1.708	1.364

Slope (m): 1.26099
 Intercept (b): -0.01392
 Correlation coefficient (r): 0.99984
 Uncertainty ($k = 2$): 0.015 m³/min

End of Certificate of Calibration

CALIBRATION TEST REPORT FOR Partisol Air Sampler

Calibrated Date: 27 January 2025
Calibrated Due on: 26 January 2026

Report No: PM-202501028

Instruments Information

Description : Thermo Scientific Partisol 2025i
Sequential Air Sampler

Model : 2025i

Sample flow control and reporting : 5 - 18 LPM

Serial No. : 2025I2 0566 1402

Instrument used for calibration [STD]

Description : Flow Meter

BIOS DryCal DC-Lite

Model : DCL-M REV. 1.08

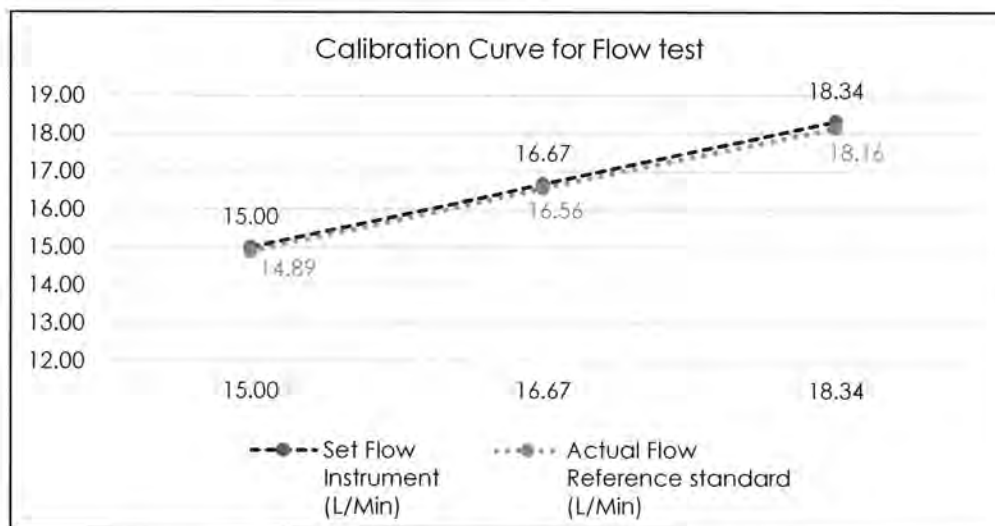
Range : 200 ml/min - 20 L/min

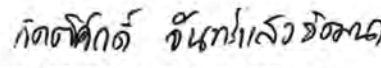
Serial No. : 5016

Environment : Temperature 25.5 °C Humidity: 51 %RH

Calibration Report

Filter	Set Flow Instrument (L/Min)	Current Flow Instrument reading (L/Min)	Actual Flow Reference standard (L/Min)	Error	Drift%
47 mm	15.00	15.00	14.89	-0.11	0.76
	16.67	16.67	16.56	-0.11	0.66
	18.34	18.34	18.16	-0.18	0.97



Calibrate By : 
MR. KITTISAK JANSANGWATTANA

Approve by : 
MR. PASAGORN SAMOL

CALIBRATION TEST REPORT FOR Partisol Air Sampler

Calibrated Date: 4 February 2026
Calibrated Due on: 3 February 2027

Report No: PM-202603029

Instruments Information

Description: Thermo Scientific Partisol 2025i
Sequential Air Sampler

Model: 2025i

Sample flow control and reporting: 5 - 18 LPM

Serial No.: 2025I2 0585 1402

Instrument used for calibration [STD]

Description: Flow Meter

BIOS DryCal DC-Lite

Model: DCL-M REV. 1.08

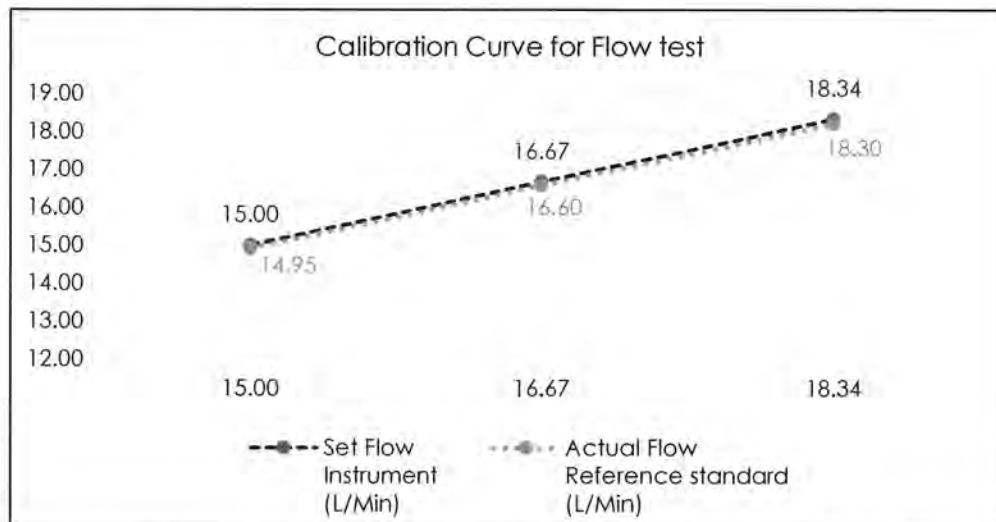
Range: 200 ml/min - 20 L/min

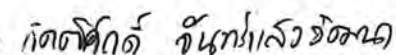
Serial No.: 5016

Environment: Temperature 25.5 °C Humidity: 51 %RH

Calibration Report

Filter	Set Flow Instrument (L/Min)	Current Flow Instrument reading (L/Min)	Actual Flow Reference standard (L/Min)	Error	Drift%
47 mm	15.00	15.00	14.95	-0.05	0.33
	16.67	16.67	16.60	-0.07	0.42
	18.34	18.34	18.30	-0.04	0.22



Calibrate By: 
MR. KITTISAK JANSANGWATTANA

Approve by: 
MR. PASAGORN SAMOL

ENVIR SERVICE CO., LTD.

42 Ramintra 14 Yeak 9, Tha Raeng, Bang Khen, Bangkok 10230
Tel. 02-9435814-5 Fax. 02-9438201 www.envirservice.co.th

CALIBRATION TEST REPORT FOR Partisol® Model 2000-H Air Sampler

Calibrated Date: 01 August 2025
Calibrated Due on: 31 July 2026

Report No: PM-202508002

Instruments Information

Description : Thermo Scientific Partisol FRM
2000 Air Sampler

Model : 2000

Sample flow control and reporting : 5 - 18 L/min

Serial No. : 200FB205150107

Instrument used for calibration [STD]

Description : Flow Meter

BIOS DryCal DC-Lite

Model : DCL-M REV. 1.08

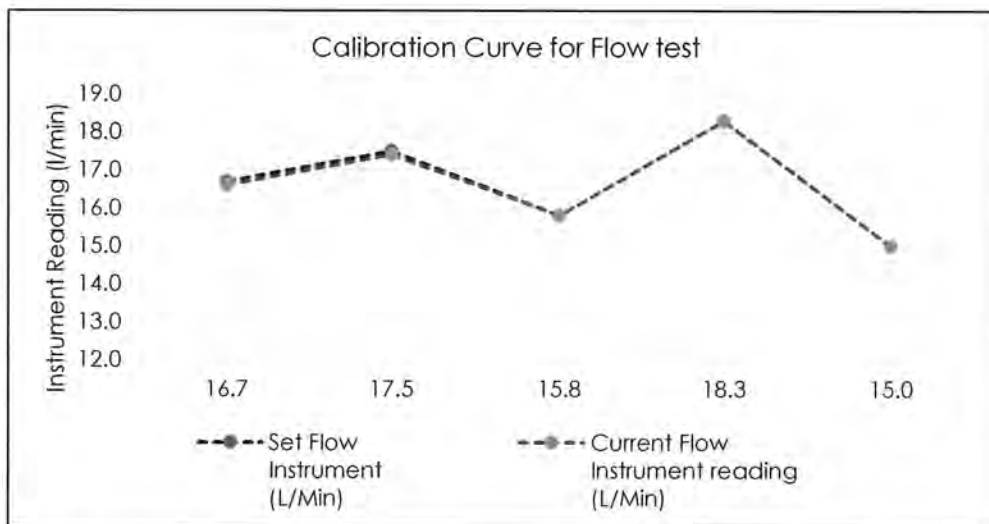
Range : 200 ml/min - 20 L/min

Serial No. : 1519

Environment : Temperature 25.5 °C Humidity: 51 %RH

Calibration Report

Filter	Set Flow Instrument (L/Min)	Current Flow Instrument reading (L/Min)	Actual Flow Reference standard (L/Min)	Flow Offset	Flow Span
47 mm.	16.7	16.6	16.7	0.0078	1.0000
	17.5	17.4	17.4	0.0078	0.9180
	15.8	15.8	15.7	0.0078	0.9534
	18.3	18.3	18.3	0.0078	0.9540
	15.0	15.0	15.1	0.0078	0.9633



Calibrate By : กิตติศักดิ์ จันทะวงษ์
MR. KITTISAK JANSANGWATTANA

Approve by : MR. PASAGORN SAMOL

Calibration Certificate

FOR

Equipment Name : PM2.5/PM10 FRM AIR SAMPLER

Received Date : Jan 27, 2026

Manufacturer : Qingdao Junray Intelligent Instrument

Calibration Date : Jan 28, 2026

Model : ZR-3930B

Recommended Due Date : N/A

Serial Number : 3930C90053336

Location of Calibration : In Lab

Customer Name : PACIFIC LABORATORY CO., LTD.

14/5358 Moo. 14 Bang Bua Thong, Bang Bua Thong District,

Nonthaburi 11110

Parameter of Calibration : Air Flow Measurement

CONDITION AS RECIVED : Normal

Environmental Conditions

Ambient Temperature : (25 ± 2) °C

Relative Humidity : (50 ± 15) %RH

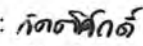
Result : Adjustment (See data attached in page 2 to the end of certificate)

1. The report applies to the item and shall not be reproduced except in full, without written approval by Calibration Laboratory, Envir Service Co., Ltd.
2. The working standard is indicated in page 2 of this certificate.
3. This result of this report only to the item calibrated.

Date of Calibration : Jan. 28, 2026

Valid to : Jan. 27, 2027



Calibrated By : 
Kittisak Jansangwattana
(Technician)

Approved By :


Pasagorn Samol
(Technician Manager)

Certificate No. EN-260128-01

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.

Reference Standard

Main Standard of measurement Used in the Calibration

Name/No.	Measuring range	Verification or Certification Organization/Certificate No.	Valid Until
BIOS Drycal Flow Meter Model DCL-MH Serial No. 5576	30 - 3000 mL/min	EN251212-1	12-Dec-25

Calibration Result

Function: Air Flow Measurement

Before Calibration

Set Flow Instrument (L/Min)	Current Flow Instrument reading (L/Min)	Actual Flow Reference Standard (L/Min)	Error	Drift%
16.67	16.67	16.79	-0.12	-0.71

After Calibration

Set Flow Instrument (L/Min)	Current Flow Instrument reading (L/Min)	Actual Flow Reference Standard (L/Min)	Error	Drift%
16.67	16.67	16.66	0.01	0.06

Note :

The Result of calibration was found accurate as show on date and place of calibration only.
This Certificate is not certified for any commercial transaction.

Calibration Certificate

FOR

Equipment Name : PM2.5/PM10 FRM AIR SAMPLER

Received Date : Jan 27, 2026

Manufacturer : Qingdao Junray Intelligent Instrument

Calibration Date : Jan 28, 2026

Model : ZR-3930B

Recommended Due Date : N/A

Serial Number : 3930C90053831

Location of Calibration : In Lab

Customer Name : PACIFIC LABORATORY CO., LTD.

14/5358 Moo. 14 Bang Bua Thong, Bang Bua Thong District,

Nonthaburi 11110

Parameter of Calibration : Air Flow Measurement

CONDITION AS RECIVED : Normal

Environmental Conditions

Ambient Temperature : $(25 \pm 2) ^\circ\text{C}$

Relative Humidity : $(50 \pm 15) \% \text{RH}$

Result : Adjustment (See data attached in page 2 to the end of certificate)

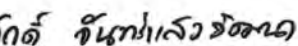
ENVIR SERVICE CO., LTD.

1. The report applies to the item and shall not be reproduced except in full, without written approval by Calibration Laboratory, Envir Service Co., Ltd.
2. The working standard is indicated in page 2 of this certificate.
3. This result of this report only to the item calibrated.

Date of Calibration : Jan. 28, 2026

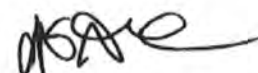
Valid to : Jan. 27, 2027



Calibrated By : 

Kittisak Jansangwattana
(Technician)

Approved By :



Pasagorn Samol
(Technician Manager)

Certificate No. EN-260128-02

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.

Reference Standard

Main Standard of measurement Used in the Calibration

Name/No.	Measuring range	Verification or Certification Organization/Certificate No.	Valid Until
Primary Flow Meter Model Defender 510-H Serial No. 120284	30 - 3000 mL/min	SPR25010241-1	17-Jan-26

Calibration Result

Function : Air Flow Measurement

Before Calibration

Set Flow Instrument (L/Min)	Current Flow Instrument reading (L/Min)	Actual Flow Reference Standard (L/Min)	Error	Drift%
16.67	16.67	16.57	0.10	0.60

After Calibration

Set Flow Instrument (L/Min)	Current Flow Instrument reading (L/Min)	Actual Flow Reference Standard (L/Min)	Error	Drift%
16.67	16.67	16.66	0.01	0.06

Note :

The Result of calibration was found accurate as show on date and place of calibration only.
This Certificate is not certified for any commercial transaction.

Calibration Certificate

FOR

Equipment Name : PM2.5/PM10 FRM AIR SAMPLER

Received Date : Jan 27, 2026

Manufacturer : Qingdao Junray Intelligent Instrument

Calibration Date : Jan 28, 2026

Model : ZR-3930B

Recommended Due Date : N/A

Serial Number : 3930C90053132

Location of Calibration : In Lab

Customer Name : PACIFIC LABORATORY CO., LTD.

14/5358 Moo. 14 Bang Bua Thong, Bang Bua Thong District,
Nonthaburi 11110

Parameter of Calibration : Air Flow Measurement

CONDITION AS RECIVED : Normal

Environmental Conditions

Ambient Temperature : $(25 \pm 2) ^\circ\text{C}$

Relative Humidity : $(50 \pm 15) \% \text{RH}$

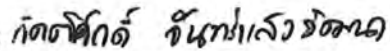
Result : Adjustment (See data attached in page 2 to the end of certificate)

1. The report applies to the item and shall not be reproduced except in full, without written approval by Calibration Laboratory, Envir Service Co., Ltd.
2. The working standard is indicated in page 2 of this certificate.
3. This result of this report only to the item calibrated.

Date of Calibration : Jan. 28, 2026

Valid to : Jan. 27, 2027



Calibrated By : 
Kittisak Jansangwattana
(Technician)

Approved By :


Pasagorn Samol
(Technician Manager)

ENVIR SERVICE CO., LTD. (HEAD OFFICE)

42 Ramintra 14, Yeak 9 Tha Raeng, Bang Khen, Bangkok 10230 Thailand

Tax ID: 0105555170865 Tel: 02-943-5814-5

Tel: 02-943-8201 www.envirservice.co.th

Certificate No. EN-260128-03

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.

Reference Standard

Main Standard of measurement Used in the Calibration

Name/No.	Measuring range	Verification or Certification Organization/Certificate No.	Valid Until
BIOS Drycal Flow Meter Model DCL-MH Serial No. 5576	30 - 3000 mL/min	EN251212-1	12-Dec-25

Calibration Result

Function : Air Flow Measurement

Before Calibration

Set Flow Instrument (L/Min)	Current Flow Instrument reading (L/Min)	Actual Flow Reference Standard (L/Min)	Error	Drift%
16.67	16.67	16.94	-0.27	-1.59

After Calibration

Set Flow Instrument (L/Min)	Current Flow Instrument reading (L/Min)	Actual Flow Reference Standard (L/Min)	Error	Drift%
16.67	16.67	16.66	0.01	0.06

Note :

The Result of calibration was found accurate as show on date and place of calibration only. This Certificate is not certified for any commercial transaction.

CAL

Calibratech Co.,Ltd.

7/106-7 Moo 2, Sukhaphrachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com



NSC-TISI-TIS 17025
CALIBRATION 0030

Certificate of Calibration

Certificate No. : 68-200468-1

Page : 1 of 2

Submitted by : Pacific Laboratory Co.,Ltd.
14/5358 Moo 14, T.Bang Bua Thong, A.Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : Electronic Balance
Manufacturer : SHIMADZU **Model :** AP225WD
Serial No. : D316301828 **ID No. :** LAB-BL-003
Capacity : 220000 mg
Resolution : 0.01mg/102000mg, 0.1mg/220000mg

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co.,Ltd.
Ambient Temperature : (27.3 to 27.4) °C
Relative Humidity : (53.6 to 53.7) %
Air Pressure : 1003.0 mbar

Date of Received : 21 July 2025

Date of Calibration : 21 July 2025

Date of Issue : 25 July 2025

Calibrated by : Akaradath Thippichai

Calibration Method : In-house method CAL-M2001 based on UKAS Publication ref : LAB 14
Edition 7 - November 2022

Reference Standard Instruments : This certification is traceable to the International System of Units

Standard Weights

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
E261-E2624	C02242009	07 Nov 2025	National Institute of Metrology (Thailand), (NIMT)

Approved by :

(Satja Sangkhum)

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full except with the prior written approval of the Calibratech Co.,Ltd.



CAL

Calibratech Co.,Ltd.

7/106-7 Moo 2, Sukhprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com

Certificate of Calibration

Certificate No. : 68-200468-1

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Departure of indication from nominal value

Nominal Value (mg)	Correction (mg)	Uncertainty $\pm$ (mg)
1	0.01	0.012
10	0.00	0.012
50	0.01	0.012
100	0.01	0.014
1000	0.00	0.026
2000	0.01	0.034
5000	0.00	0.043
20000	0.00	0.071
50000	0.01	0.11
100000	0.00	0.20
150000	0.0	0.38
200000	0.0	0.38

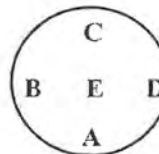
This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor $k = 2.06$, providing a level of confidence of approximately 95%

Eccentric error

Load test : 50000 mg

A	B	C	D	E	
0.01	0.01	0.02	0.02	0.00	mg



Repeatability

Load test : 200000 mg

Stdev. : 0.053 mg

A handwritten signature in black ink, appearing to be 'S. J.' or similar.

- o0o -



ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์ **Blue Consultant Limited Partnership**

32/751 ถนนประชาอุทิศ แขวงทุ่งครุ เขตทุ่งครุ กรุงเทพฯ 10140

โทร.0-2873-6045-6 โทรสาร 0-2873-6046

ห้องปฏิบัติการวิเคราะห์เอกซเรย์ไอออนบวกลงวันที่ 22 สิงหาคม 2566

CALIBRATION REPORT

Equipment: SO₂ Analyzer

Brand/Model: Thermo/43C

Serial No.: 43C-67199-356, 43C-73378-373

Date of Calibrate: January 20, 2026

Reference Standard

Cylinder No.: EB0128767

Certification Date: October 29, 2019

Expiry Date: October 29, 2027

Component: SO₂: 55.62 ppm, NO: 57.21 ppm, CO: 4,551 ppm

Calibration Check (Before Adjust)

Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
43C-67199-356	-0.1	0	-0.1	400.3	400	0.3
43C-73378-373	0.2	0	0.2	397.2	400	-2.8

Calibration Check (After Adjust)

Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
43C-67199-356	0	0	0	400	400	0
43C-73378-373	0	0	0	400	400	0

ในนามห้องปฏิบัติการห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์

.....
Wany Olanthawong

(นางสาวนิคดา อนันต์สุวรรณชัย)

ผู้จัดการห้องปฏิบัติการ

Blue Consultant Limited Partnership

ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์ **Blue Consultant Limited Partnership**

188/98 ซอยพุทธบูชา 36 แขวงบางมด เขตทุ่งครุ กรุงเทพฯ 10140

โทร.0-2873-6045-6 โทรสาร 0-2873-6046

ห้องปฏิบัติการวิเคราะห์เอกสารใบอนุญาตลงวันที่ 22 สิงหาคม 2566

CALIBRATION REPORT

Equipment: SO₂ Analyzer

Serial No.: 43C-67199-356

Brand/Model: Thermo/43C

Date of Calibrate: March 26, 2026

Reference Standard

Certification Date: October 29, 2019

Component: SO₂: 55.62 ppm, NO: 57.21 ppm, CO: 4,551 ppm

Cylinder No.: EB0128767

Expiry Date: October 29, 2027

Calibration Check (Before Adjust)						
Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
43C-67199-356	0.2	0	0.2	397.8	400	-2.2
Calibration Check (After Adjust)						
Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
43C-67199-356	0	0	0	400	400	0

ในนามห้องปฏิบัติการห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์

.....

(นางสาวนิดดา อนันต์สุวรรณชัย)

ผู้จัดการห้องปฏิบัติการ

ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์ **Blue Consultant Limited Partnership**

32/751 ถนนประชาอุทิศ แขวงทุ่งครุ เขตทุ่งครุ กรุงเทพฯ 10140

โทร.0-2873-6045-6 โทรสาร 0-2873-6046

ห้องปฏิบัติการวิเคราะห์เอกซเรย์ไอออนบวกลงวันที่ 22 สิงหาคม 2566

CALIBRATION REPORT

Equipment: NOx Analyzer

Serial No.: 3205, 17C-68152-359

Brand/Model: Teledyne-API/T200, Thermo/42C

Date of Calibrate: January 20, 2026

Reference Standard

Certification Date: October 29, 2019

Component: SO₂: 55.62 ppm, NO: 57.21 ppm, CO: 4,551 ppm

Cylinder No.: EB0128767

Expiry Date: October 29, 2027

Calibration Check (Before Adjust)

Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
	NO/NO ₂ /NO _x	NO/NO ₂ /NO _x	NO/NO ₂ /NO _x	NO/NO ₂ /NO _x	NO/NO ₂ /NO _x	NO/NO ₂ /NO _x
3205	4.0/1.1/5.1	0/0/0	4.0/1.1/5.1	401.3/3.8/405.1	400/0/400	1.3/3.8/5.1
17C-68152-359	4.6/1.3/5.9	0/0/0	4.6/1.3/5.9	402.0/4.1/406.1	400/0/400	2.0/4.1/6.1

Calibration Check (After Adjust)

Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
	NO/NO ₂ /NO _x	NO/NO ₂ /NO _x	NO/NO ₂ /NO _x	NO/NO ₂ /NO _x	NO/NO ₂ /NO _x	NO/NO ₂ /NO _x
3205	0/0/0	0/0/0	0/0/0	400/0/400	400/0/400	0/0/0
17C-68152-359	0/0/0	0/0/0	0/0/0	400/0/400	400/0/400	0/0/0

ในนามห้องปฏิบัติการห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์

(นางสาวนิตดา อนันต์สุวรรณชัย)

ผู้จัดการห้องปฏิบัติการ

ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์ **Blue Consultant Limited Partnership**

188/98 ซอยพุทธบูชา 36 แขวงบางมด เขตทุ่งครุ กรุงเทพฯ 10140

โทร.0-2873-6045-6 โทรสาร 0-2873-6046

ห้องปฏิบัติการวิเคราะห์เอกสารใบอนุญาตลงวันที่ 22 สิงหาคม 2566

CALIBRATION REPORT

Equipment: NOx Analyzer

Brand/Model: Teledyne-API/200E

Serial No.: 2508

Date of Calibrate: March 26, 2026

Reference Standard

Cylinder No.: EB0128767

Certification Date: October 29, 2019

Expiry Date: October 29, 2027

Component: SO2: 55.62 ppm, NO: 57.21 ppm, CO: 4,551 ppm

Calibration Check (Before Adjust)

Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx
2508	4.4/1.6/6.0	0/0/0	4.4/1.6/6.0	396.8/3.2/400.0	400/0/400	-3.2/3.2/0.0

Calibration Check (After Adjust)

Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx
2508	0/0/0	0/0/0	0/0/0	400/0/400	400/0/400	0/0/0

ในนามห้องปฏิบัติการห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์
Blue Consultant Limited Partnership

.....
(นางสาวนิตดา อนันต์สุวรรณชัย)
ผู้จัดการห้องปฏิบัติการ

ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์ **Blue Consultant Limited Partnership**

32/751 ถนนประชาอุทิศ แขวงทุ่งครุ เขตทุ่งครุ กรุงเทพฯ 10140

โทร.0-2873-6045-6 โทรสาร 0-2873-6046

ห้องปฏิบัติการวิเคราะห์เอกซเรย์โพโนมิตาลงวันที่ 22 สิงหาคม 2566

CALIBRATION REPORT

Equipment : CO Analyzer
Serial No.: 678, 3445

Brand/Model: Teledyne-API/T300
Date of Calibrate : January 20, 2026

Reference Standard

Cylinder No.: EB0128767

Certification Date: October 29, 2019

Expiry Date: October 29, 2027

Component: SO₂: 55.62 ppm , NO: 57.21 ppm , CO : 4,551 ppm

Calibration Check (Before Adjust)

Serial No.	Zero			Span		
	Reading Value (ppm)	Expected Value (ppm)	Drift (ppm)	Reading Value (ppm)	Expected Value (ppm)	Drift (ppm)
678	0.2	0	0.2	39.5	40	-0.5
3445	-0.2	0	-0.2	40.4	40	0.4

Calibration Check (After Adjust)

Serial No.	Zero			Span		
	Reading Value (ppm)	Expected Value (ppm)	Drift (ppm)	Reading Value (ppm)	Expected Value (ppm)	Drift (ppm)
678	0	0	0	40	40	0
3445	0	0	0	40	40	0

ในนามห้องปฏิบัติการห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์



(นางสาวนิดดา อนันต์สุวรรณชัย)

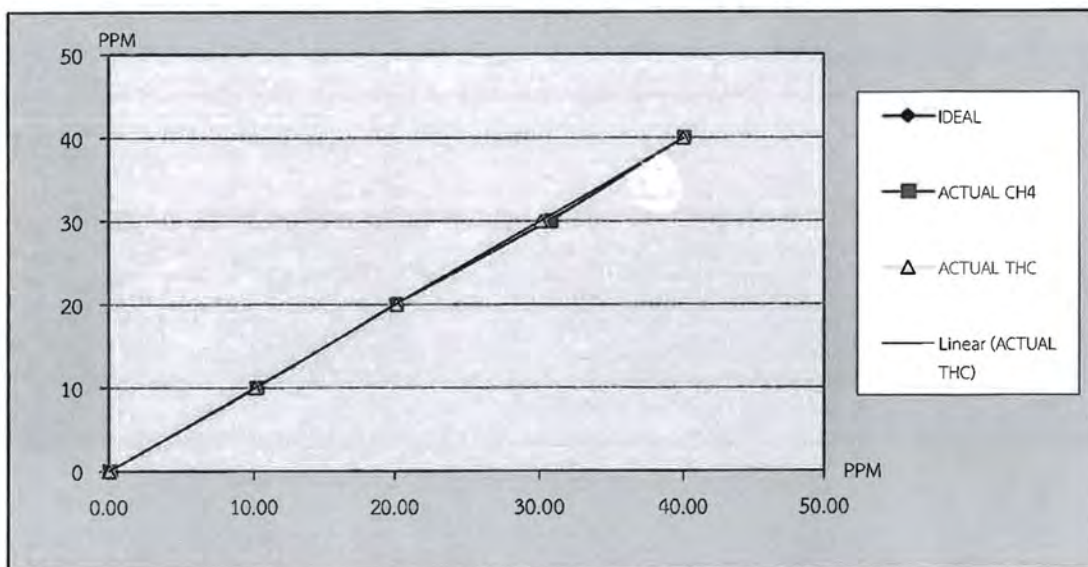
ผู้จัดการห้องปฏิบัติการ

TEST REPORT

CUSTOMER NAME	: Pacific Laboratory Co., Ltd.						
EQUIPMENT NAME	: THC Analyzer						
MANUFACTURER	: HORIBA	MODEL	: APHA-370	SERIAL NO	: 3TEBP31U		
STANDARD GAS CONCENTRATION (PPM) (CH ₄)	: 506.1 PPM			CYLINDER NO	: CC734373		
CYLINDER PRESSURE (psig)	: 1,600 PSI			CERTIFIED DATE	: 12/05/2020		
CERTIFIED BY	: AIRGAS			EXPIRED DATE	: 12/05/2028		

TEST RESULTS

POINT NO	TEST RESULTS						
	IDEAL	ACTUAL CH ₄	ERROR CH ₄	%ERROR CH ₄	ACTUAL THC	ERROR THC	%ERROR THC
ZERO	0.00	0.00	0.00	-	0.00	0.00	-
1	10.00	10.09	0.09	0.90	10.01	0.01	0.10
2	20.00	20.04	0.04	0.20	20.09	0.09	0.45
3	30.00	30.66	0.66	2.20	30.07	0.07	0.23
4	40.00	39.99	-0.01	-0.02	40.00	0.00	0.00
AVERAGE (%)				0.82			0.20



CALIBRATED BY :

อ.จ.พงศ์

DATE :

3/7/68

CHECKED BY :

ส.ร. วัฒนา

JIRANATEE ASSOCIATES CO., LTD.

DATE :

3/7/68

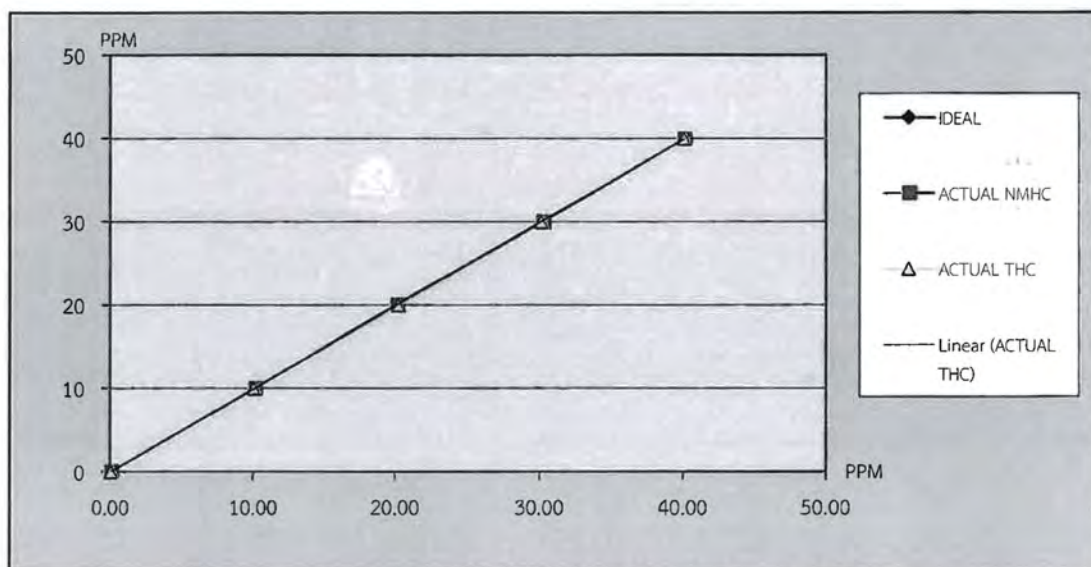
ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : เจ้าหน้าที่ฝ่ายบริการหลังการขาย , โทร 02-868-0812 # 15,16 , E-Mail : Engineer@jiranatee.com
เลขที่ 63/14-15,67/35-36 ถนนเพชรเกษม 7,7/1 แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพฯ 10600 โทร 02-8680812-13 โทรสาร 02-868-1889

TEST REPORT

CUSTOMER NAME	: Pacific Laboratory Co., Ltd.						
EQUIPMENT NAME	: THC Analyzer						
MANUFACTURER	: HORIBA	MODEL	: APHA-370	SERIAL NO	: 3TEBP31U		
STANDARD GAS CONCENTRATION (PPM) (Propane)	200 PPM			CYLINDER NO	: D621701		
CYLINDER PRESSURE (psig)	: 1,900 PSI			CERTIFIED DATE	: 27/06/2018		
CERTIFIED BY	: Linde			EXPIRED DATE	: 27/06/2026		

TEST RESULTS

POINT NO	TEST RESULTS						
	IDEAL	ACTUAL NMHC	ERROR NMHC	%ERROR NMHC	ACTUAL THC	ERROR THC	%ERROR THC
ZERO	0.00	0.00	0.00	-	0.01	0.01	-
1	10.00	10.09	0.09	0.90	10.00	0.00	0.00
2	20.00	20.10	0.10	0.50	20.20	0.20	1.00
3	30.00	30.20	0.20	0.67	30.10	0.10	0.33
4	40.00	40.02	0.02	0.05	40.03	0.03	0.08
AVERAGE (%)				0.53			0.35



CALIBRATED BY :

ผู้จัดทำ

DATE :

3/7/68

CHECKED BY :

ผู้ตรวจ

DATE :

3/7/68

ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : เจ้าหน้าที่ฝ่ายบริการหลังการขาย , โทร 02-868-0812 # 15,16 , E-Mail : Engineer@jiranatee.com
 เลขที่ 63/14-15,67/35-36 ถนนเพชรเกษม 7,7/1 แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพฯ 10600 โทร 02-8680812-13 โทรสาร 02-868-1889

CHECK LIST

CUSTOMER NAME	: Pacific Laboratory Co., Ltd.		
EQUIPMENT NAME	: THC Analyzer		
MANUFACTURER	: HORIBA	MODEL : APHA-370	SERIAL NO. : 3TEBP31U

TEST VALUES				
NO.	THC Analyzer (APHA - 370)	UNIT	BEFORE	AFTER
1	Signal (CH4)	mV	41.20	25.20
2	Signal (THC)	mV	52.80	30.70
3	Detector	Temp °C , Standard Value : Ambient temp+(5°Cto15°C)	36.70	42.90
		Pressure kPa , Standard Value : (Ambient/1013x100-20)±4kPa	81.20	80.90
4	Ambient	kPa current atmospheric pressure	101.10	100.70
5	Purifire	°C , Standard Value : 390 °C to 430 °C	271.10	419.70
		kPa , Normal value : 8 kPa to 25 kPa	9.60	9.60
6	NMHC	°C , Standard Value : 230 °C to 260 °C	117.90	234.70
7	DC 24 V	V , Standard Value : 24 V ± 0.5 V	23.90	23.90
8	DC 5 V	V , Standard Value : 5 V ± 0.5 V	5.00	5.00
9	Bypass (Optional)	L/min, Normal value : 0.9 L/min ± 0.3 L/min	-	-
10	Over Flow (Optional)	L/min, Standard Value : 0.8 L/min or More	-	-
11	CH4 Samping Reading	PPM	3.55	2.28
12	NMHC Samping Reading	PPM	0.39	0.39
13	THC Samping Reading	PPM	3.99	2.67
14	Zero Gas CH4/THC	PPM	0.01/-0.02	0.00/0.00
15	Span Gas	PPM	39.82/36.12	39.99/40.00
G	Gas H2/.....	20 PSI	20	20

Remark : Reference EX-EN-017-56 , Ambient HC Monitor APHA-370 Operetion Manual Page #81

Remark : (Ambeint temperature = 5°C to 40°C)

อาการที่ตรวจพบ

- Service Maintenance.

รายละเอียดการดำเนินการ

- ทำ Calibration Zero/Span , Multipoint

ผลการดำเนินการ

- เรียบร้อย เครื่องสามารถดำเนินการตรวจวัดได้ตามปกติ

CALIBRATED BY : ณัฐพงศ์

CHECKED BY : ณัฐพงศ์ วชิระ



DATE : 3/7/68

DATE : 3/7/68

ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : เจ้าหน้าที่ฝ่ายบริการหลังการขาย , โทร 02-868-0812 # 15-16 , E-Mail : Engineer@jiranatee.com

เลขที่ 63/14-15,67/35-36 ซอยเพชรเกษม 7,7/1 ถนนเพชรเกษม แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพฯ 10600 โทร 02-868-0812-13 โทรสาร 02-868-1889

ภาคผนวกที่ 5-2
เอกสารสอบเทียบเครื่องมือตรวจวัดระดับเสียง



Professional Calibration & Services Co., Ltd.

50/888, 50/889 Moo 2, Rungsit-Nakornayok Rd., Bungyeetho, Thunyaburi,
Pathumthani 12130 Thailand
Tel : (+66)2150-6641 (Autoline)
Email : info@p-cal.com www.p-cal.com



Certificate of Calibration

Certificate Number : EL40431/25

Page 1 of 3

Control Number : PCAL153035

Customer Control : -

Description : Sound Calibrator

Manufacturer : SOUNDTEK

Model : ST-120

Serial Number : 211203764

Customer : Pacific Laboratory Co., Ltd.

14/5358 Moo 14, Tambol Bang Bua Thong, Amphoe Bang Bua Thong,
Nonthaburi 11110

Date of Receipt : 16-Jul-25

Date of Calibration : 16-Jul-25

Calibration Location : Electrical Laboratory

Environment : Temperature $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$

: Relative Humidity $50\% \pm 20\%$

Calibration Method : Calibration Procedure Number CP-EL35

Calibration Results : See data attached



The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%.

This certificate is issued in accordance with ISO/IEC17025 and the conditions of accreditation granted by the Accreditation Body which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. The results relate only to the item calibrated.

This certificate shall not be reproduced other than in full except without the prior written approval of the Head of Calibration Laboratory of Professional Calibration & Services Co., Ltd.

Calibrated By

Ms. Janjira Intapat

Authorized Signature

(Mr. Jumnong Junphong)

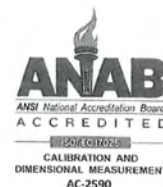
23-Jul-25

Issued Date



Professional Calibration & Services Co., Ltd.

50/888, 50/889 Moo 2, Rungsit-Nakornnayok Rd., Bungyeetho, Thunyaburi,
Pathumthani 12130 Thailand
Tel : (+66)2150-6641 (Autoline)
Email : info@p-cal.com www.p-cal.com



Calibration Report

Certificate Number : EL40431/25

Page 2 of 3

Equipment Standards Used

Description	Serial No.	Traceability to	Certificate No.	Cal. Due Date
Sound Level Meter	030606101	ANAB : AC-2590	EL11791/25	11-Mar-26
Sound Calibrator	125626778	NSC : Calibration 0037	EEL.BP. 99/0168	23-Jan-26

Condition as received : Normal

Definitions :-

- * ANAB - The ANSI National Accreditation Board
- * NSC - National Standardization Council of Thailand



Professional Calibration & Services Co., Ltd.

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Pathumthani 12130 Thailand
Tel : (+66)2150-6641 (Autoline)
Email : info@p-cal.com www.p-cal.com



Calibration Report

Certificate No.: EL40431/25

Page : 3 of 3

Calibration Results

Sound Pressure Level Accuracy

Nominal Value	Measured Value	UUC Error	Uncertainty (±)
94 dB	94.01 dB	-0.01 dB	0.18 dB
114 dB	114.08 dB	-0.08 dB	0.17 dB

...End...





PN-Tech Instruments Co., Ltd.

100/64 Moo.6 T.Ladsewai R.Lamlukka Pathumthani 12150

Tel. 092-824-246), 061-993-6478 www.pntech-i.com

Email : info.pntinstruments@gmail.com, info@pntech-i.com



CERTIFICATE OF CALIBRATION

Certificate Number	:	PNT06-26-198-1	Page : 1 of 3
Customer	:	Pacific Laboratory Co.,Ltd.	
	:	14/5358 Moo 14 Tambol Bang Bua Thong	
	:	Amphoe Bang Thong, Nonthaburi 11110	
Description of Equipment	:	Sound Calibrator	
Manufacturer	:	Soundtek	
Model Number	:	ST-120	
Serial Number	:	211203764	
ID Number	:	N/A	
Calibration Location	:	In-Lab	
Ambient Temperature	:	23.4 °C (± 3.0 °C)	
Ambient Humidity	:	54.1 %RH (± 20.0 %RH)	
Received Date	:	05-Jun-26	
Calibration Date	:	17-Jun-26	
Procedure	:	CP-43-EL	

This certifies that the above instrument was calibrated in compliance with the calibration systems requirement of ISO/IEC 17025 : 2017 in accordance with referenced procedures. Standards used to perform this calibration are certified by or traceable to National Institute of Metrology (Thailand) and/or other recognized national measurement institutes which realizes the units of measurement according to the International System of Units (SI Unit).

A binary decision rule, utilizing simple acceptance criteria is used for the determination of compliance statements.

Result are reported without factoring in the effects of measurement uncertainty.

Issued Date : 19-Jun-26

Calibration by : Mr.Parinya Chungklueng

Quality Assurance : Mr.Natthaphol Boonmee

Approved by :

Mr.Paitoon Chungklueng
Authorized Signatory



PN-Tech Instruments Co., Ltd.

100/64 Moo.6 T.Ladsawai R.Lamlukka Pathumthani 12150

Tel. 092-824-2461, 061-993-6478 www.pntech-i.com

Email : info.pntinstruments@gmail.com, info@pntech-i.com



CALIBRATION REPORT

Certificate Number : PNT06-26-198-1

Page : 2 of 3

Standard Equipment Used

<u>Equip. No.</u>	<u>Equipment Name</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
PNS-043	Sound Level Calibrator	N949786	EL64654/24	23-Dec-26
PNS-044	Sound Level Meter	00766532	SC240254	28-Oct-26

Traceability

This certificate is traceable to the International System of Unit (SI Unit) maintained at ;

- Professional Calibration & Services Co., Ltd.



PN-Tech Instruments Co., Ltd.

100/64 Moo.6 T.Ladsawai R.Lamlukka Pathumthani 12150

Tel. 092-824-2461, 061-993-6478 www.pntech-i.com

Email : info.pntinstruments@gmail.com, info@pntech-i.com



CALIBRATION REPORT

Certificate Number : PNT06-26-198-1

Page : 3 of 3

Results of Calibration : (/) Without Adjustment () With Adjustment

Function : Sound Level Calibrator Measurement

: Output Frequency : 1 kHz

UUC Range : 94 and 114 dB

Output Sound Level

Switch selection	UUC Setting (dB)	Measured Value (dB)	UUC Error (dB)	Tolerance (±) (dB)	Uncertainty (±) (dB)
94	94	94.25	-0.25	0.50	0.28
114	114	114.37	-0.37	0.50	0.28

**** End of Certificate****

Sound Level Meter Calibration Report

Calibrate No. : SLM 203/2568

Calibrate Date : December 30, 2025

Equipment	: Sound Calibrator
Manufacturer	: Soundtek
Model/Type	: ST-120
Serial No.	: 211203764
Sound Pressure Level	: 94 and 114 dB
Accuracy	: $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
Frequency	: $1000\text{Hz} \pm 1\%$
Customer Name	: บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

[illegible]

Approved By


(Miss Sakuna Supparot)
Technician



PN-Tech Instruments Co., Ltd.

100/64 Moo.6 T.Ladsawai R.Lamlukka Pathumthani 12150

Tel. 092-824-2461, 061-993-6478 www.pntech-i.com

Email : info.pntinstruments@gmail.com, info@pntech-i.com



CERTIFICATE OF CALIBRATION

Certificate Number : PNT12-25-248-4

Customer : Pacific Laboratory Co.,Ltd.
: 14/5358 Moo 14 Tambol Bang Bua Thong
: Amphoe Bang Thong, Nonthaburi 11110

Description of Equipment : Sound Level Meter

Manufacturer : ACO

Model Number : 6236

Serial Number : 222041

ID Number : N/A

Calibration Location : In-Lab

Ambient Temperature : 23.2 °C (± 3.0 °C)

Ambient Humidity : 53.8 %RH (± 20.0 %RH)

Received Date : 04-Dec-25

Calibration Date : 09-Dec-25

Procedure : CP-43-EL

Page : 1 of 3

This certifies that the above instrument was calibrated in compliance with the calibration systems requirement of ISO/IEC 17025 : 2017 in accordance with referenced procedures. Standards used to perform this calibration are certified by or traceable to National Institute of Metrology (Thailand) and/or other recognized national measurement institutes which realizes the units of measurement according to the International System of Units (SI Unit).

A binary decision rule, utilizing simple acceptance criteria is used for the determination of compliance statements.

Result are reported without factoring in the effects of measurement uncertainty.

Issued Date : 11-Dec-25

Calibration by : Mr.Paitoon Chungklueng

Quality Assurance : Mr.Natthaphol Boonmee

Approved by :

Mr.Paitoon Chungklueng
Authorized Signatory



PN-Tech Instruments Co., Ltd.

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CALIBRATION REPORT

Certificate Number : PNT12-25-248-4

Page : 2 of 3

Standard Equipment Used

<u>Equip. No.</u>	<u>Equipment Name</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
PNS-043	Sound Level Calibrator	N949786	EL64654/24	23-Dec-25

Traceability

This certificate is traceable to the International System of Unit (SI Unit) maintained at ;

- Professional Calibration & Services Co., Ltd.



PN-Tech Instruments Co., Ltd.

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CALIBRATION REPORT

Certificate Number : PNT12-25-248-4

Page : 3 of 3

Results of Calibration : (/) Without Adjustment () With Adjustment

Function : Sound Level Measurement : (Test Mode Slow)

UUC Range : 40 to 130 dB

Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.3	0.03	0.28
	114.30	114.1	-0.20	0.28
LC	94.27	94.3	0.03	0.28
	114.30	114.1	-0.20	0.28

Function : Sound Level Measurement : (Test Mode Fast)

UUC Range : 40 to 130 dB

Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.3	0.03	0.28
	114.30	114.1	-0.20	0.28
LC	94.27	94.3	0.03	0.28
	114.30	114.1	-0.20	0.28

**** End of Certificate****



PN-Tech Instruments Co., Ltd.

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Tel. 092-824-2461, 061-993-6478 www.pntech-i.com

Email : info.pntinstruments@gmail.com, info@pntech-i.com



CERTIFICATE OF CALIBRATION

Certificate Number : PNT11-25-227-4

Page : 1 of 3

Customer : Pacific Laboratory Co.,Ltd.
: 14/5358 Moo 14 Tambol Bang Bua Thong
: Amphoe Bang Thong, Nonthaburi 11110

Description of Equipment : Sound Level Meter
Manufacturer : ACO
Model Number : Type 6236
Serial Number : 222019
ID Number : N/A
Calibration Location : In-Lab
Ambient Temperature : 23.6 °C (± 3.0 °C)
Ambient Humidity : 54.3 %RH (± 20.0 %RH)
Received Date : 19-Nov-25
Calibration Date : 24-Nov-25
Procedure : CP-43-EL

This certifies that the above instrument was calibrated in compliance with the calibration systems requirement of ISO/IEC 17025 : 2017 in accordance with referenced procedures. Standards used to perform this calibration are certified by or traceable to National Institute of Metrology (Thailand) and/or other recognized national measurement institutes which realizes the units of measurement according to the International System of Units (SI Unit).

A binary decision rule, utilizing simple acceptance criteria is used for the determination of compliance statements.

Result are reported without factoring in the effects of measurement uncertainty.

Issued Date : 26-Nov-25

Calibration by : Mr.Paitoon Chungklueng

Approved by :

Quality Assurance : Mr.Natthaphol Boonmee

Mr.Paitoon Chungklueng
Authorized Signatory



PN-Tech Instruments Co., Ltd.

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CALIBRATION REPORT

Certificate Number : PNT11-25-227-4

Page : 2 of 3

Standard Equipment Used

<u>Equip. No.</u>	<u>Equipment Name</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
PNS-043	Sound Level Calibrator	N949786	EL64654/24	23-Dec-25

Traceability

This certificate is traceable to the International System of Unit (SI Unit) maintained at ;

- Professional Calibration & Services Co., Ltd.



PN-Tech Instruments Co., Ltd.

100/64 Moo.6 T.Ladsawai R.Lamlukka Pathumthani 12150
Tel. 092-824-2461, 061-993-6478 www.pntech-i.com
Email : info.pntinstruments@gmail.com, info@pntech-i.com



CALIBRATION REPORT

Certificate Number : PNT11-25-227-4

Page : 3 of 3

Results of Calibration : (/) Without Adjustment () With Adjustment

Function : Sound Level Measurement : (Test Mode Slow)
UUC Range : 40 to 130 dB
Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.5	0.23	0.28
	114.30	114.1	-0.20	0.28
LC	94.27	94.5	0.23	0.28
	114.30	114.1	-0.20	0.28

Function : Sound Level Measurement : (Test Mode Fast)
UUC Range : 40 to 130 dB
Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.5	0.23	0.28
	114.30	114.2	-0.10	0.28
LC	94.27	94.5	0.23	0.28
	114.30	114.2	-0.10	0.28

**** End of Certificate****



A Tresscal company



ID LINE : IEC17025

METROLOGY SYSTEM (THAILAND) CO.,LTD.



Certificate of Calibration

Certificate Number : SPR25010109-5

Page : 1 of 3

Customer : TOPS-LAB Consultants CO., LTD.

189 Moo. 3 Bangrakphatthana Bangbuathong Nonthaburi 11110

Equipment Name : Sound Level Meter

Manufacturer : Scarlet Tech

Model : ST-11D

Serial Number : 820953

ID. Number : TLC-S-030

Environmental Conditions

Ambient Temperature : $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$

Relative Humidity : $50\% \pm 15\%$

Location of Calibration : In-Lab

Calibration Procedure : SP-CPE-04-01

Received Date : 10 Jan 2025

Calibration Date : 16 Jan 2025

Recommend Due Date : 16 Jan 2026

Date of Issue : 17 Jan 2025

Method of Calibration

This certifies that the above instrument was calibrated in compliance with the calibration system requirement of ISO/IEC 17025:2017 in accordance with reference procedure. Standards used to perform this calibration are certified by to NIST or equivalent, National metrology institute, Natural physical constants, consensus standards. The result reported herein apply only to the calibration of the item described above as received. Our decision rule is to contact the customer if the item pass and fail calibration when the results include the uncertainties and the customer must determine if the results meets their needs.

The calibration certificate shall not be reproduced except in full, without written approval of SP Metrology System (Thailand).

Calibrated by : Mr.Nanthawat Wanasit

Calibration Officer

Approved by :

(Mr.Pootthipong A.)

Authorized Signatory



Calibration Report

Certificate Number : SPR25010109-5

Page : 2 of 3

Reference Standards

Equipment Name	Model	Serial No.	Certificate No.	Due. Date
Sound Level Calibrator	ST-120	211203773	EEL.BP. 140/0167	26 Jan 2025

Traceability

This certification is traceable to the International System of Unit maintained at :

TISTR - Thailand Institute of Scientific and Technological Research



Result of Calibration

Certificate Number : SPR25010109-5

Page : 3 of 3

Range : 94 to 114 dB

Function : @1kHz

Select A

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	93.9	93.9	-0.1	-0.1	0.15
114	113.8	113.8	-0.2	-0.2	0.15

Select C

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	93.8	93.8	-0.2	-0.2	0.15
114	113.7	113.7	-0.3	-0.3	0.15

Select Z

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	93.8	93.8	-0.2	-0.2	0.15
114	113.7	113.7	-0.3	-0.3	0.15

Note :

The result of calibration was found accurate as show on date and place of calibration only.
This Certificate is not certified for any commercial transaction.

Measurement Uncertainty

The reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor $k = 2.00$, providing a level of confidence approximately 95%.

- End of Certificate -

CERTIFICATE OF CALIBRATION

NO. 20230113101

Name of Product:	Sound Level Meter
Model:	ST-11D
Serial Number:	820861
Specification:	Class 1
Conclusion:	Pass
Date of calibration:	2025-03-20
Due Date:	2026-03-20

Calibrated by: *Jim Lin*

- 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: AWA14425-57294

4. Measuring up limit: 140 dBA

3. Adjustments to indicated sound levels:

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

Type of Calibrator B&K 4231

Sound Pressure Level 94.0 dB

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
10	-71.0	-14.8	-0.8	1000	0.0	0.0	-0.1
20	-50.4	-6.3	-0.4	2000	1.3	-0.2	-0.1
31.5	-39.5	-3.0	-0.1	4000	1.1	-0.8	-0.1
63	-26.2	-0.8	-0.2	8000	-1.0	-3.0	0.0
125	-16.2	-0.2	-0.1	12500	-11.7	-13.7	0.0
250	-8.7	-0.1	-0.1	16000	-11.8	-13.8	0.0
500	-3.2	0.0	-0.1	20000	-23.8	-25.8	-0.3

6. Self-generated noise

Microphone replaced by electrical input signal device

10.3 dB(A)	12.2 dB(C)	19.4 dB(Z)
------------	------------	------------

7. F&S Weighting

Rate of the F weighting decrease (dB/s)	35.1
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			
	L _{Afmax} -L _A	L _{ASmax} -L _A	L _{Af} -L _A	L _{AeqT} -L _A
500	0.0	-4.0	-2.9	-7.0
200	-0.9	-7.4	-6.9	-7.0
2	-18.0	-26.9	-26.9	-7.0
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
L _{Cpeak} -L _C (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: 112.8 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}	103.2	103.2	0.0
L ₅	110.8	110.8	0.0
L ₁₀	108.8	108.8	0.0
L ₅₀	92.9	92.8	0.1
L ₉₀	76.9	76.8	0.1
L ₉₅	75.0	74.9	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

Reference equipment used in the calibration:

Description:	Model	Serial No.	Expiry Date	Traceable To
Microphone	B&K 4191	2929405	2024-12-15	NML
Multi function sound calibrator	B&K 4226	2288444	2024-10-15	CIGISMEC
Signal generator	DS 360	33873	2024-10-15	CEPREI

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 $\pm 20\%$.
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



APTITECH CALIBRATION CO., LTD.

50/40 Moo 5 T. Lat Sawai, A. Lamlukka, Pathumthani 12150
Tel. +66 2103-6290 Fax. +66 2103-6291
Email. sales@aptitech-cal.com



CERTIFICATE OF CALIBRATION

Certificate Number : SC240293

Customer : Pacific Laboratory Co.,Ltd.
Address : 14/5358 Moo 14 Tambol Bang Bua Thong, Amphoe Bang Thong, Nonthaburi 11110

Description	: Sound Level Meter	W/O Number	: SC240293
Manufacturer	: ACO	Calibration Location	: Laboratory
Model	: 6236	Ambient Temperature	: 22 ± 2 °C
Serial Number	: 222016	Ambient Humidity	: 50 ± 15 %RH
ID. Number	: N/A	Received Date	: 16-Dec-24

This certifies that the above instrument was calibrated in compliance with the Calibration Systems Requirement of ISO/IEC 17025:2017 in accordance with referenced procedures. Standards used to perform this calibration are certified by or traceable to National Institute of Metrology (Thailand) and/or other recognized national measurement institutes which realizes the units of measurement according to the International System of Units (SI Unit).

Measurement uncertainties at the time of test are given where applicable. They are calculated in accordance with the method described in The Expression of Uncertainty and Confidence in Measurement (M3003).

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by coverage factor $k=2$ such that the coverage probability corresponds to approximately 95%. This result of calibration was found accurate as shown on date and place of calibration only.

Standard Equipments

Description	Serial No.	Certificate No.	Traceability	Due Date
Sound Level Calibrator	141011576	CP20240179EA	TISI: 22-LB0119	14-May-25

APTITECH

Authority of Calibration

Approved Signatory

Calibration Date : 17-Dec-2024

Issued Date : 20-Dec-2024

Calibrated By : Mr.Worachot Thongthin

- ☒ Mr. Anuwat Simsiriwat [Laboratory Manager]
☐ Mr. Nattaphol Boonmee [Quality Manager]

Calibration certificates without signatures are not valid. This certificate applied to only the item identified and shall not be reproduced other than in full, without the specific written approval by APTITECH CALIBRATION CO., LTD.



APTITECH CALIBRATION CO., LTD.

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CALIBRATION REPORT

Certificate Number : SC240293

Calibration Method

The Unit Under Calibration (UUC) was calibrated by comparison measurement with sound level calibrator. The calibration has been accomplished in an ambient environment controlled, base on the in-house calibration procedure. The identification of the laboratory's calibration procedure employed are CP-7.2-01-107

Calibration Results

Appearance and function of use : Good
Results of Calibration : Without any adjustment

Sound Level Measurement (Slow Mode)

Function	UUC Range	Standard Value	UUC Reading	UUC Error	(±) Uncertainty
LA	40-130 dB	93.86 dB	94.1 dB	0.24 dB	0.60 dB
		113.87 dB	113.7 dB	-0.17 dB	0.60 dB
LC	40-130 dB	93.86 dB	94.1 dB	0.24 dB	0.60 dB
		113.87 dB	113.7 dB	-0.17 dB	0.60 dB

Sound Level Measurement (Fast Mode)

Function	UUC Range	Standard Value	UUC Reading	UUC Error	(±) Uncertainty
LA	40-130 dB	93.86 dB	94.1 dB	0.24 dB	0.60 dB
		113.87 dB	113.7 dB	-0.17 dB	0.60 dB
LC	40-130 dB	93.86 dB	94.1 dB	0.24 dB	0.60 dB
		113.87 dB	113.7 dB	-0.17 dB	0.60 dB

--- End of Certificate ---



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CERTIFICATE OF CALIBRATION

Certificate Number : EI250215

Customer : Pacific Laboratory Co.,Ltd.
Address : 14/5358 Moo 14 Tambol Bang Bua Thong Amphoe Bang Thong, Nonthaburi 11110

Description	: Sound Level Meter	W/O Number	: EI250215
Manufacturer	: ACO	Calibration Location	: Laboratory
Model	: 6236	Ambient Temperature	: 22 ± 2 °C
Serial Number	: 222138	Ambient Humidity	: 55 ± 15 %RH
ID. Number	: N/A	Received Date	: 21-Jan-25

This certifies that the above instrument was calibrated in compliance with the Calibration Systems Requirement of ISO/IEC 17025:2017 in accordance with referenced procedures. Standards used to perform this calibration are certified by or traceable to National Institute of Metrology (Thailand) and/or other recognized national measurement institutes which realizes the units of measurement according to the International System of Units (SI Unit).

Measurement uncertainties at the time of test are given where applicable. They are calculated in accordance with the method described in The Expression of Uncertainty and Confidence in Measurement (M3003).

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by coverage factor $k=2$ such that the coverage probability corresponds to approximately 95%. This result of calibration was found accurate as shown on date and place of calibration only.

Standard Equipments

Description	Serial No.	Certificate No.	Traceability	Due Date
Sound Level Calibrator	141011576	CP20240179EA	TISI: 22-LB0119	14-May-25

APTITECH

Authority of Calibration

Approved Signatory

- ☒ Mr. Anuwat Simsiriwat [Laboratory Manager]
☐ Mr. Kornupong Suksamran [Technical Manager]

Calibration Date : 27-Jan-2025

Issued Date : 30-Jan-2025

Calibrated By : Ms. Hathaichanok Kaewsrirai

Calibration certificates without signatures are not valid. This certificate applied to only the item identified and shall not be reproduced other than in full, without the specific written approval by APTITECH CALIBRATION CO., LTD.



APTITECH CALIBRATION CO., LTD.

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Email. sales@aptitech-cal.com



CALIBRATION REPORT

Certificate Number : EI250215

Calibration Method

The Unit Under Calibration (UUC) was calibrated by comparison measurement with sound level calibrator. The calibration has been accomplished in an ambient environment controlled, base on the in-house calibration procedure. The identification of the laboratory's calibration procedure employed are CP-7.2-01-107

Calibration Results

Appearance and function of use : Good
Results of Calibration : Without any adjustment

Sound Level Measurement (Slow Mode)

Function	UUC Range	Standard Value	UUC Reading	UUC Error	(±) Uncertainty
LA	40-130 dB	93.86 dB	94.1 dB	0.24 dB	0.60 dB
		113.87 dB	113.6 dB	-0.27 dB	0.60 dB
LC	40-130 dB	93.86 dB	94.1 dB	0.24 dB	0.60 dB
		113.87 dB	113.6 dB	-0.27 dB	0.60 dB

Sound Level Measurement (Fast Mode)

Function	UUC Range	Standard Value	UUC Reading	UUC Error	(±) Uncertainty
LA	40-130 dB	93.86 dB	94.1 dB	0.24 dB	0.60 dB
		113.87 dB	113.5 dB	-0.37 dB	0.60 dB
LC	40-130 dB	93.86 dB	94.1 dB	0.24 dB	0.60 dB
		113.87 dB	113.5 dB	-0.37 dB	0.60 dB

--- End of Certificate ---

Sound Level Meter Calibration Report

Calibrate No. : SLM 001/2569

Calibrate Date : January 28, 2026

Equipment : Sound Calibrator
Manufacturer : Soundtek
Model/Type : ST-120
Serial No. : 211203764
Sound Pressure Level : 94 and 114 dB
Accuracy : $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
Frequency : $1000\text{Hz} \pm 1\%$
Customer Name : บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

Item	Instrument	Manufacturer	Model	Serial No.	Before Adjust	After Adjust	Inspection Result
1.	Sound Level Meter	ACO Co., Ltd.	6226	200046	93.7	94.0	Pass
					113.9	114.0	Pass
1.	Sound Level Meter	ACO Co., Ltd.	6226	200038	93.9	94.0	Pass
					114.1	114.0	Pass

Approved By


 Sakuna S.
 (Miss Sakuna Supparot)
 Technician

Sound Level Meter Calibration Report

Calibrate No. : SLM 009/2569
Calibrate Date : January 30, 2026

Equipment : Sound Calibrator
Manufacturer : Soundtek
Model/Type : ST-120
Serial No. : 211203764
Sound Pressure Level : 94 and 114 dB
Accuracy : $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
Frequency : $1000\text{Hz} \pm 1\%$
Customer Name : บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

Item	Instrument	Manufacturer	Model	Serial No.	Before Adjust	After Adjust	Inspection Result
1.	Sound Level Meter	ACO Co., Ltd.	6226	200038	94.1	94.0	Pass
					113.8	114.0	Pass
1.	Sound Level Meter	ACO Co., Ltd.	6226	200046	93.9	94.0	Pass
					113.9	114.0	Pass

Approved By


Sakuna.S
(Miss Sakuna Supparot)
Technician



PACIFIC

LABORATORY CO., LTD.

Pacific Laboratory Co., Ltd.
 14/5358 Moo 14 Tambol Bang Bua Thong
 Amphoe Bang Bua Thong, Nonthaburi 11110
 Tel. : 0-2045-2446-7 Fax. : 0-2045-3991
 E-mail : pacificlab07@gmail.com
 www.pacificlaboratory.com
 Head office/Tax 0125550044098

Sound Level Meter Calibration Report

Calibrate No. : SLM 010/2569
 Calibrate Date : February 9, 2026

Equipment : Sound Calibrator
 Manufacturer : Soundtek
 Model/Type : ST-120
 Serial No. : 211203764
 Sound Pressure Level : 94 and 114 dB
 Accuracy : $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
 Frequency : $1000\text{Hz} \pm 1\%$
 Customer Name : บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

Item	Instrument	Manufacturer	Model	Serial No.	Before Adjust	After Adjust	Inspection Result
1.	Sound Level Meter	ACO Co., Ltd.	6226	200046	93.8	94.0	Pass
					113.7	114.0	Pass
1.	Sound Level Meter	ACO Co., Ltd.	6226	200038	93.9	94.0	Pass
					114.1	114.0	Pass

Approved By


 Sakuna S.
 (Miss Sakuna Supparot)
 Technician



PACIFIC

LABORATORY CO., LTD.

Pacific Laboratory Co., Ltd.
 14/5358 Moo 14 Tambol Bang Bua Thong
 Amphoe Bang Bua Thong, Nonthaburi 11110
 Tel. : 0-2045-2446-7 Fax. : 0-2045-3991
 E-mail : pacificlab07@gmail.com
 www.pacificlaboratory.com
 Head office/Tax 0125550044098

Sound Level Meter Calibration Report

Calibrate No. : SLM 011/2569
 Calibrate Date : February 17, 2026

Equipment : Sound Calibrator
 Manufacturer : Soundtek
 Model/Type : ST-120
 Serial No. : 211203764
 Sound Pressure Level : 94 and 114 dB
 Accuracy : $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
 Frequency : $1000\text{Hz} \pm 1\%$
 Customer Name : บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

Item	Instrument	Manufacturer	Model	Serial No.	Before Adjust	After Adjust	Inspection Result
1.	Sound Level Meter	ACO Co., Ltd.	6226	200045	93.9	94.0	Pass
					113.7	114.0	Pass
1.	Sound Level Meter	ACO Co., Ltd.	6226	200046	94.1	94.0	Pass
					113.9	114.0	Pass

Approved By


 (Miss Sakuna Supparot)
 Technician

CERTIFICATE OF CALIBRATION

NO. 20230113102

Name of Product:	Sound Level Meter
Model:	ST-11D
Serial Number:	820862
Specification:	Class 1
Conclusion:	Pass
Date of calibration:	2025-03-20
Due Date:	2026-03-20

Calibrated by: *Jim Lin*

- 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.
- This certificate is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
- 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: AWA14425-55113

4. Measuring up limit: 140 dBA

3. Adjustments to indicated sound levels:

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

Type of Calibrator B&K 4231

Sound Pressure Level 94.0 dB

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
10	-71.2	-14.6	-1.2	1000	0.0	0.0	-0.1
20	-50.4	-6.3	-0.5	2000	1.3	-0.2	-0.1
31.5	-39.5	-3.0	-0.3	4000	1.1	-0.8	-0.1
63	-26.2	-0.8	-0.2	8000	-1.0	-3.0	0.0
125	-16.2	-0.2	-0.1	12500	-11.7	-13.7	0.0
250	-8.7	-0.1	-0.1	16000	-11.8	-13.8	0.0
500	-3.2	0.0	-0.1	20000	-23.9	-25.9	-0.3

6. Self-generated noise

Microphone replaced by electrical input signal device

7.8 dB(A)	8.1 dB(C)	19.6 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 dBMax error at 10dB steps upper reference sound level 0.1 dBMax error at 1dB steps within 5dB of the upper limit linear operating range 0.0 dBMax error at 10dB steps below reference sound level 0.1 dBMax 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	LAF-LA	LAeq-LA
500	0.0	-4.0	-2.9	-7.0
200	-1.0	-7.4	-6.9	-7.0
2	-18.1	-26.9	-26.9	-7.0
0.25	-27.1	/	-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	2.3	2.4	2.3	2.4

11. Overload indication: Pass**12. Statistical analysis function**Sweep signal maximum indicated sound level: 112.8 dBSweep amplitude: 40 dBScan cycle time: 60 S; Measurement period: 180 S.

Items	Measured value/dB	Theoretical calculated value/dB	Error/dB
L _{Aeq,T}	103.2	103.2	0.0
L ₅	110.8	110.8	0.0
L ₁₀	108.8	108.8	0.0
L ₅₀	92.9	92.8	0.1
L ₉₀	76.9	76.8	0.1
L ₉₅	75.0	74.9	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

Reference equipment used in the calibration:

Description:	Model	Serial No.	Expiry Date	Traceable To
Microphone	B&K 4191	2929405	2024-12-15	NML
Multi function sound calibrator	B&K 4226	2288444	2024-10-15	CIGISMEC
Signal generator	DS 360	33873	2024-10-15	CEPREI

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 $\pm 20\%$.
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



Sound Level Meter Calibration Report

Calibrate No. : SLM 012/2569

Calibrate Date : February 25, 2026

Equipment	: Sound Calibrator
Manufacturer	: Soundtek
Model/Type	: ST-120
Serial No.	: 211203764
Sound Pressure Level	: 94 and 114 dB
Accuracy	: $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
Frequency	: $1000\text{Hz} \pm 1\%$
Customer Name	: บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

[illegible]

Approved By



PACIFIC LABORATORY COLLEGE
Sakuna S
PCL
(Miss Sakuna Supparot)
Technician



PACIFIC

LABORATORY CO., LTD.

Pacific Laboratory Co., Ltd.
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 Head office/Tax 0125550044098

Sound Level Meter Calibration Report

Calibrate No. : SLM 013/2569

Calibrate Date : March 3, 2026

Equipment : Sound Calibrator
 Manufacturer : Soundtek
 Model/Type : ST-120
 Serial No. : 211203764
 Sound Pressure Level : 94 and 114 dB
 Accuracy : $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
 Frequency : $1000\text{Hz} \pm 1\%$
 Customer Name : บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

Item	Instrument	Manufacturer	Model	Serial No.	Before Adjust	After Adjust	Inspection Result
1.	Sound Level Meter	ACO Co., Ltd.	6226	200035	94.1	94.0	Pass
					114.2	114.0	Pass
1.	Sound Level Meter	ACO Co., Ltd.	6226	200042	93.9	94.0	Pass
					114.1	114.0	Pass

Approved By


 (Miss Sakuna Supparot)
 Technician



Professional Calibration & Services Co., Ltd.

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Certificate of Calibration

Certificate Number : EL40429/25
Control Number : PCAL193431
Customer Control : -
Description : Sound Level Meter
Manufacturer : Scarler Tech
Model : ST-11D
Serial Number : 820968
Customer : Pacific Laboratory Co., Ltd.

Page 1 of 3



14/5358 Moo 14, Tambol Bang Bua Thong, Amphoe Bang Bua Thong,
Nonthaburi 11110

Date of Receipt : 16-Jul-25
Date of Calibration : 16-Jul-25
Calibration Location : Electrical Laboratory
Environment : Temperature $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$
: Relative Humidity $50\% \pm 20\%$
Calibration Method : Calibration Procedure Number CP-EL35
Calibration Results : See data attached

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%.

This certificate is issued in accordance with ISO/IEC17025 and the conditions of accreditation granted by the Accreditation Body which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. The results relate only to the item calibrated.

This certificate shall not be reproduced other than in full except without the prior written approval of the Head of Calibration Laboratory of Professional Calibration & Services Co., Ltd.

Calibrated By

Ms. Janjira Intapat

Authorized Signature

(Mr. Jumnong Junphong)

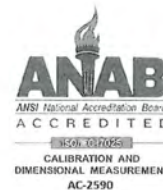
23-Jul-25

Issued Date



Professional Calibration & Services Co., Ltd.

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Calibration Report

Certificate Number : EL40429/25

Page 2 of 3

Equipment Standards Used

Description	Serial No.	Traceability to	Certificate No.	Cal. Due Date
Sound Calibrator	125626778	NSC : Calibration 0037	EEL.BP. 99/0168	23-Jan-26

Condition as received : Normal

Definitions :-

* NSC - National Standardization Council of Thailand



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Calibration Report

Certificate No.: EL40429/25

Page : 3 of 3

Calibration Results

Sound Level Measurement Accuracy

(UUC Setting : A-Weighting, Time Weighting : Slow)

UUC Range	UUC Parameter	Standard Value	UUC Reading	UUC Error	Uncertainty (±)
27 to 140 dB	LFp	94 dB	94.1 dB	0.1 dB	0.17 dB
		114 dB	114.1 dB	0.1 dB	0.17 dB
27 to 140 dB	LSp	94 dB	94.1 dB	0.1 dB	0.17 dB
		114 dB	114.1 dB	0.1 dB	0.17 dB
27 to 140 dB	Llp	94 dB	94.1 dB	0.1 dB	0.17 dB
		114 dB	114.1 dB	0.1 dB	0.17 dB

(UUC Setting : A-Weighting, Time Weighting : Fast)

UUC Range	UUC Parameter	Standard Value	UUC Reading	UUC Error	Uncertainty (±)
27 to 140 dB	LFp	94 dB	94.0 dB	0.0 dB	0.17 dB
		114 dB	114.1 dB	0.1 dB	0.17 dB
27 to 140 dB	LSp	94 dB	93.9 dB	-0.1 dB	0.17 dB
		114 dB	114.1 dB	0.1 dB	0.17 dB
27 to 140 dB	Llp	94 dB	93.9 dB	-0.1 dB	0.17 dB
		114 dB	114.1 dB	0.1 dB	0.17 dB

...End...

Sound Level Meter Calibration Report

Calibrate No. : SLM 018/2569

Calibrate Date : March 15, 2026

Equipment	: Sound Calibrator
Manufacturer	: Soundtek
Model/Type	: ST-120
Serial No.	: 211203764
Sound Pressure Level	: 94 and 114 dB
Accuracy	: $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
Frequency	: $1000\text{Hz} \pm 1\%$
Customer Name	: บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

[illegible]

Approved By


Sakuna, S.
(Miss Sakuna Supparot)
Technician

Sound Level Meter Calibration Report

Calibrate No. : SLM 019/2569

Calibrate Date : March 23, 2026

Equipment : Sound Calibrator
Manufacturer : Soundtek
Model/Type : ST-120
Serial No. : 211203764
Sound Pressure Level : 94 and 114 dB
Accuracy : $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
Frequency : $1000\text{Hz} \pm 1\%$
Customer Name : บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

Item	Instrument	Manufacturer	Model	Serial No.	Before Adjust	After Adjust	Inspection Result
1.	Sound Level Meter	ACO Co., Ltd.	6226	200045	93.7	94.0	Pass
					113.9	114.0	Pass
2.	Sound Level Meter	ACO Co., Ltd.	6226	180048	94.1	94.0	Pass
					114.2	114.0	Pass

Approved By


 Sakuna S.
 (Miss Sakuna Supparot)
 Technician



PACIFIC

LABORATORY CO., LTD.

Pacific Laboratory Co., Ltd.
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Sound Level Meter Calibration Report

Calibrate No. : SLM 021/2569

Calibrate Date : March 31, 2026

Equipment : Sound Calibrator
Manufacturer : Soundtek
Model/Type : ST-120
Serial No. : 211203764
Sound Pressure Level : 94 and 114 dB
Accuracy : $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
Frequency : $1000\text{Hz} \pm 1\%$
Customer Name : บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

Item	Instrument	Manufacturer	Model	Serial No.	Before Adjust	After Adjust	Inspection Result
1.	Sound Level Meter	ACO Co., Ltd.	6226	180048	93.9	94.0	Pass
					113.8	114.0	Pass
2.	Sound Level Meter	ACO Co., Ltd.	6226	200040	93.8	94.0	Pass
					113.9	114.0	Pass

Approved By


Sakuna, S.
(Miss Sakuna Supparot)
Technician



PN-Tech Instruments Co., Ltd.

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Email : info.pntinstruments@gmail.com, info@pntech-i.com



CERTIFICATE OF CALIBRATION

Certificate Number : PNT01-26-026-8 Page : 1 of 3

Customer : Pacific Laboratory Co.,Ltd.
: 14/5358 Moo 14 Tambol Bang Bua Thong
: Amphoe Bang Thong, Nonthaburi 11110

Description of Equipment : Sound Level Meter

Manufacturer : Scarlet Tech

Model Number : ST-11D

Serial Number : 820967

ID Number : N/A

Calibration Location : In-Lab

Ambient Temperature : 23.4 °C (± 3.0 °C)

Ambient Humidity : 53.4 %RH (± 20.0 %RH)

Received Date : 26-Jan-26

Calibration Date : 30-Jan-26

Procedure : CP-43-EL

This certifies that the above instrument was calibrated in compliance with the calibration systems requirement of ISO/IEC 17025 : 2017 in accordance with referenced procedures. Standards used to perform this calibration are certified by or traceable to National Institute of Metrology (Thailand) and/or other recognized national measurement institutes which realizes the units of measurement according to the International System of Units (SI Unit).

A binary decision rule, utilizing simple acceptance criteria is used for the determination of compliance statements.

Result are reported without factoring in the effects of measurement uncertainty.

Issued Date : 02-Feb-26

Calibration by : Mr.Parinya Chungklueng

Approved by :

Quality Assurance : Mr.Natthaphol Boonmee

Mr.Paitoon Chungklueng
Authorized Signatory



PN-Tech Instruments Co., Ltd.

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CALIBRATION REPORT

Certificate Number : PNT01-26-026-8

Page : 2 of 3

Standard Equipment Used

<u>Equip. No.</u>	<u>Equipment Name</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
PNS-043	Sound Level Calibrator	N949786	EL64654/24	23-Dec-26

Traceability

This certificate is traceable to the International System of Unit (SI Unit) maintained at ;

- Professional Calibration & Services Co., Ltd.



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CALIBRATION REPORT

Certificate Number : PNT01-26-026-8

Page : 3 of 3

Results of Calibration : (/) Without Adjustment () With Adjustment

Function : Sound Level Measurement
: Frequency Weighting (A)
: Time weighting (Slow)

UUC Range : 20 to 140 dB

Resolution : 0.1 dB

Main Parameter of Measurement

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LFp	94.27	94.5	0.23	0.28
	114.30	114.0	-0.30	0.28
LSp	94.27	94.5	0.23	0.28
	114.30	114.1	-0.20	0.28
Llp	94.27	94.5	0.23	0.28
	114.30	114.1	-0.20	0.28

Function : Sound Level Measurement
: Frequency Weighting (A)
: Time weighting (Fast)

UUC Range : 20 to 140 dB

Resolution : 0.1 dB

Main Parameter of Measurement

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LFp	94.27	94.5	0.23	0.28
	114.30	114.1	-0.20	0.28
LSp	94.27	94.5	0.23	0.28
	114.30	114.1	-0.20	0.28
Llp	94.27	94.5	0.23	0.28
	114.30	114.1	-0.20	0.28

**** End of Certificate****



PN-Tech Instruments Co., Ltd.

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Tel. 092-824-2461, 061-993-6478 www.pntech-i.com

Email : info.pntinstruments@gmail.com, info@pntech-i.com



CERTIFICATE OF CALIBRATION

Certificate Number : PNT01-26-026-4

Page : 1 of 3

Customer : Pacific Laboratory Co.,Ltd.
: 14/5358 Moo 14 Tambol Bang Bua Thong
: Amphoe Bang Thong, Nonthaburi 11110

Description of Equipment : Sound Level Meter
Manufacturer : ACO
Model Number : 6236
Serial Number : 222170
ID Number : N/A
Calibration Location : In-Lab
Ambient Temperature : 23.2 °C (± 3.0 °C)
Ambient Humidity : 53.6 %RH (± 20.0 %RH)
Received Date : 26-Jan-26
Calibration Date : 30-Jan-26
Procedure : CP-43-EL

This certifies that the above instrument was calibrated in compliance with the calibration systems requirement of ISO/IEC 17025 : 2017 in accordance with referenced procedures. Standards used to perform this calibration are certified by or traceable to National Institute of Metrology (Thailand) and/or other recognized national measurement institutes which realizes the units of measurement according to the International System of Units (SI Unit).

A binary decision rule, utilizing simple acceptance criteria is used for the determination of compliance statements.

Result are reported without factoring in the effects of measurement uncertainty.

Issued Date : 02-Feb-26

Calibration by : Mr.Parinya Chungklueg

Approved by :

Quality Assurance : Mr.Natthaphol Boonmee

Mr.Paitoon Chungklueg
Authorized Signatory



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CALIBRATION REPORT

Certificate Number : PNT01-26-026-4

Page : 2 of 3

Standard Equipment Used

<u>Equip. No.</u>	<u>Equipment Name</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
PNS-043	Sound Level Calibrator	N949786	EL64654/24	23-Dec-26

Traceability

This certificate is traceable to the International System of Unit (SI Unit) maintained at ;

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CALIBRATION REPORT

Certificate Number : PNT01-26-026-4

Page : 3 of 3

Results of Calibration : (/) Without Adjustment () With Adjustment

Function : Sound Level Measurement : (Test Mode Slow)

UUC Range : 40 to 130 dB

Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.3	0.03	0.28
	114.30	113.8	-0.50	0.28
LC	94.27	94.3	0.03	0.28
	114.30	113.9	-0.40	0.28

Function : Sound Level Measurement : (Test Mode Fast)

UUC Range : 40 to 130 dB

Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.3	0.03	0.28
	114.30	113.8	-0.50	0.28
LC	94.27	94.3	0.03	0.28
	114.30	113.9	-0.40	0.28

**** End of Certificate****



PN-Tech Instruments Co., Ltd.

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CERTIFICATE OF CALIBRATION

Certificate Number : PNT01-26-020-4

Page : 1 of 3

Customer : Pacific Laboratory Co.,Ltd.
: 14/5358 Moo 14 Tambol Bang Bua Thong
: Amphoe Bang Thong, Nonthaburi 11110

Description of Equipment : Sound Level Meter
Manufacturer : ACO
Model Number : 6236
Serial Number : 222138
ID Number : N/A
Calibration Location : In-Lab
Ambient Temperature : 23.6 °C (± 3.0 °C)
Ambient Humidity : 53.4 %RH (± 20.0 %RH)
Received Date : 23-Jan-26
Calibration Date : 24-Jan-26
Procedure : CP-43-EL

This certifies that the above instrument was calibrated in compliance with the calibration systems requirement of ISO/IEC 17025 : 2017 in accordance with referenced procedures. Standards used to perform this calibration are certified by or traceable to National Institute of Metrology (Thailand) and/or other recognized national measurement institutes which realizes the units of measurement according to the International System of Units (SI Unit).

A binary decision rule, utilizing simple acceptance criteria is used for the determination of compliance statements.

Result are reported without factoring in the effects of measurement uncertainty.

Issued Date : 26-Jan-26

Calibration by : Mr.Parinya Chungklueng

Approved by :

Quality Assurance : Mr.Natthaphol Boonmee

Mr.Paitoon Chungklueng
Authorized Signatory



PN-Tech Instruments Co., Ltd.

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CALIBRATION REPORT

Certificate Number : PNT01-26-020-4

Page : 2 of 3

Standard Equipment Used

<u>Equip. No.</u>	<u>Equipment Name</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
PNS-043	Sound Level Calibrator	N949786	EL64654/24	23-Dec-26

Traceability

This certificate is traceable to the International System of Unit (SI Unit) maintained at ;

- Professional Calibration & Services Co., Ltd.



PN-Tech Instruments Co., Ltd.

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Email : info.pntinstruments@gmail.com, info@pntech-i.com



CALIBRATION REPORT

Certificate Number : PNT01-26-020-4

Page : 3 of 3

Results of Calibration : (/) Without Adjustment () With Adjustment

Function : Sound Level Measurement : (Test Mode Slow)

UUC Range : 40 to 130 dB

Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.4	0.13	0.28
	114.30	114.1	-0.20	0.28
LC	94.27	94.4	0.13	0.28
	114.30	114.1	-0.20	0.28

Function : Sound Level Measurement : (Test Mode Fast)

UUC Range : 40 to 130 dB

Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.4	0.13	0.28
	114.30	114.1	-0.20	0.28
LC	94.27	94.4	0.13	0.28
	114.30	114.1	-0.20	0.28

**** End of Certificate****

ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์ **Blue Consultant Limited Partnership**

32/751 ถนนประชาอุทิศ แขวงทุ่งครุ เขตทุ่งครุ กรุงเทพฯ 10140

โทร.0-2873-6045-6 โทรสาร 0-2873-6046

ห้องปฏิบัติการวิเคราะห์เอกซเรย์อนุญาตลงวันที่ 22 สิงหาคม 2566

CALIBRATION REPORT

Instrument: Sound Level Meter

Manufacturer: ACO Co., Ltd. Model: 6236

Date of Calibrate: January 23, 2026

Dued Date of Calibrate: January 23, 2027

Calibrator: Sound Calibrator

Manufacturer: Scarlet Tech Co., Ltd.

Model: ST-120

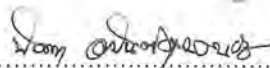
Serial No.: ST120C0267E

Range of Calibrator: 93.93 dB

Calibration Report

No.	Serial No.	Before Adjust	After Adjust	Inspection Result
3	090158	93.7	93.9	Pass
4	090171	93.8	93.9	Pass

ในนามห้องปฏิบัติการห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์



(นางสาวนิตดา อนันต์สุวรรณชัย)

ผู้จัดการห้องปฏิบัติการ



PN-Tech Instruments Co., Ltd.

100/64 Moo.6 T.Ladsawai A.Lamlukka Pathumthani 12150

Tel. 092-824-2461, 061-993-6478 www.pntech-i.com

Email : info.pntinstruments@gmail.com, info@pntech-i.com



CERTIFICATE OF CALIBRATION

Certificate Number : PNT12-25-248-1

Page : 1 of 3

Customer : Pacific Laboratory Co.,Ltd.
: 14/5358 Moo 14 Tambol Bang Bua Thong
: Amphoe Bang Thong, Nonthaburi 11110

Description of Equipment : Sound Level Meter
Manufacturer : ACO
Model Number : 6236
Serial Number : 222015
ID Number : N/A
Calibration Location : In-Lab
Ambient Temperature : 23.2 °C (± 3.0 °C)
Ambient Humidity : 53.8 %RH (± 20.0 %RH)
Received Date : 04-Dec-25
Calibration Date : 09-Dec-25
Procedure : CP-43-EL

This certifies that the above instrument was calibrated in compliance with the calibration systems requirement of ISO/IEC 17025 : 2017 in accordance with referenced procedures. Standards used to perform this calibration are certified by or traceable to National Institute of Metrology (Thailand) and/or other recognized national measurement institutes which realizes the units of measurement according to the International System of Units (SI Unit).

A binary decision rule, utilizing simple acceptance criteria is used for the determination of compliance statements.

Result are reported without factoring in the effects of measurement uncertainty.

Issued Date : 11-Dec-25

Calibration by : Mr.Paitoon Chungklueng

Approved by :

Quality Assurance : Mr.Natthaphol Boonmee

Mr.Paitoon Chungklueng
Authorized Signatory



PN-Tech Instruments Co., Ltd.

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CALIBRATION REPORT

Certificate Number : PNT12-25-248-1

Page : 2 of 3

Standard Equipment Used

<u>Equip. No.</u>	<u>Equipment Name</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
PNS-043	Sound Level Calibrator	N949786	EL64654/24	23-Dec-25

Traceability

This certificate is traceable to the International System of Unit (SI Unit) maintained at ;

- Professional Calibration & Services Co., Ltd.



PN-Tech Instruments Co., Ltd.

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Email : info.pntinstruments@gmail.com, info@pntech-i.com



CALIBRATION REPORT

Certificate Number : PNT12-25-248-1

Page : 3 of 3

Results of Calibration : (/) Without Adjustment () With Adjustment

Function : Sound Level Measurement : (Test Mode Slow)

UUC Range : 40 to 130 dB

Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.3	0.03	0.28
	114.30	114.0	-0.30	0.28
LC	94.27	94.2	-0.07	0.28
	114.30	113.9	-0.40	0.28

Function : Sound Level Measurement : (Test Mode Fast)

UUC Range : 40 to 130 dB

Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.3	0.03	0.28
	114.30	114.0	-0.30	0.28
LC	94.27	94.2	-0.07	0.28
	114.30	113.9	-0.40	0.28

**** End of Certificate****



PN-Tech Instruments Co., Ltd.

100/64 Moo.6 T.Ladsawai R.Lamlukka Pathumthani 12150
Tel. 092-824-2461, 061-993-6478 www.pntech-i.com
Email : info.pntinstruments@gmail.com, info@pntech-i.com



CERTIFICATE OF CALIBRATION

Certificate Number : PNT09-25-150-2

Page : 1 of 3

Customer : Pacific Laboratory Co.,Ltd.
: 14/5358 Moo 14 Tambol Bang Bua Thong
: Amphoe Bang Thong, Nonthaburi 11110

Description of Equipment : Sound Level Meter
Manufacturer : ACO
Model Number : Type 6236
Serial Number : 222172
ID Number : N/A
Calibration Location : In-Lab
Ambient Temperature : 23.2 °C (± 3.0 °C)
Ambient Humidity : 55.3 %RH (± 20.0 %RH)
Received Date : 02-Sep-25
Calibration Date : 05-Sep-25
Procedure : CP-43-EL

This certifies that the above instrument was calibrated in compliance with the calibration systems requirement of ISO/IEC 17025 : 2017 in accordance with referenced procedures. Standards used to perform this calibration are certified by or traceable to National Institute of Metrology (Thailand) and/or other recognized national measurement institutes which realizes the units of measurement according to the International System of Units (SI Unit).

A binary decision rule, utilizing simple acceptance criteria is used for the determination of compliance statements.

Result are reported without factoring in the effects of measurement uncertainty.

Issued Date : 08-Sep-25

Calibration by : Mr.Paitoon Chungklueng

Approved by :

Quality Assurance : Mr.Natthaphol Boonmee

Mr.Paitoon Chungklueng
Authorized Signatory



PN-Tech Instruments Co., Ltd.

100/64 Moo.5 T.Ladsawai R.Lamlukka Pathumthani 12150
Tel. 092-824-2461, 061-993-6478 www.pntech-i.com
Email : info.pntinstruments@gmail.com, info@pntech-i.com



CALIBRATION REPORT

Certificate Number : PNT09-25-150-2

Page : 2 of 3

Standard Equipment Used

<u>Equip. No.</u>	<u>Equipment Name</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
PNS-043	Sound Level Calibrator	N949786	EL64654/24	23-Dec-25

Traceability

This certificate is traceable to the International System of Unit (SI Unit) maintained at ;

- Professional Calibration & Services Co., Ltd.



PN-Tech Instruments Co., Ltd.

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Email : info.pntinstruments@gmail.com, info@pntech-i.com



CALIBRATION REPORT

Certificate Number : PNT09-25-150-2

Page : 3 of 3

Results of Calibration : (/) Without Adjustment () With Adjustment

Function : Sound Level Measurement : (Test Mode Slow)

UUC Range : 40 to 130 dB

Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.2	-0.07	0.28
	114.30	114.1	-0.20	0.28
LC	94.27	94.2	-0.07	0.28
	114.30	114.1	-0.20	0.28

Function : Sound Level Measurement : (Test Mode Fast)

UUC Range : 40 to 130 dB

Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.2	-0.07	0.28
	114.30	114.1	-0.20	0.28
LC	94.27	94.2	-0.07	0.28
	114.30	114.1	-0.20	0.28

**** End of Certificate****



PACIFIC

LABORATORY CO., LTD.

Pacific Laboratory Co., Ltd.
 14/5358 Moo 14 Tambol Bang Bua Thong
 Amphoe Bang Bua Thong, Nonthaburi 11110
 Tel. : 0-2045-2446-7 Fax : 0-2045-3991
 E-mail : pacificlab07@gmail.com
 www.pacificlaboratory.com
 Head office/Tax 0125550044098

Sound Level Meter Calibration Report

Calibrate No. : SLM 034/2569

Calibrate Date : May 5, 2026

Equipment : Sound Calibrator
 Manufacturer : Soundtek
 Model/Type : ST-120
 Serial No. : 211203764
 Sound Pressure Level : 94 and 114 dB
 Accuracy : $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
 Frequency : $1000\text{Hz} \pm 1\%$
 Customer Name : บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

Item	Instrument	Manufacturer	Model	Serial No.	Before Adjust	After Adjust	Inspection Result
1.	Sound Level Meter	ACO Co., Ltd.	6226	180048	94.2	94.0	Pass
					114.1	114.0	Pass
2.	Sound Level Meter	ACO Co., Ltd.	6226	180045	93.8	94.0	Pass
					113.7	114.0	Pass

Approved By


 Sakuna S
 (Miss Sakuna Supparot)
 Technician



PN-Tech Instruments Co., Ltd.

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Tel. 092-824-2461, 061-999-6478 www.pntech-i.com
Email : info.pntinstruments@gmail.com, info@pntech-i.com



CERTIFICATE OF CALIBRATION

Certificate Number : PNT01-26-026-1

Customer : Pacific Laboratory Co.,Ltd.
: 14/5358 Moo 14 Tambol Bang Bua Thong
: Amphoe Bang Thong, Nonthaburi 11110

Description of Equipment : Sound Level Meter

Manufacturer : ACO

Model Number : 6236

Serial Number : 222134

ID Number : N/A

Calibration Location : In-Lab

Ambient Temperature : 23.2 °C (± 3.0 °C)

Ambient Humidity : 53.6 %RH (± 20.0 %RH)

Received Date : 26-Jan-26

Calibration Date : 30-Jan-26

Procedure : CP-43-EL

Page : 1 of 3

This certifies that the above instrument was calibrated in compliance with the calibration systems requirement of ISO/IEC 17025 : 2017 in accordance with referenced procedures. Standards used to perform this calibration are certified by or traceable to National Institute of Metrology (Thailand) and/or other recognized national measurement institutes which realizes the units of measurement according to the International System of Units (SI Unit).

A binary decision rule, utilizing simple acceptance criteria is used for the determination of compliance statements. Result are reported without factoring in the effects of measurement uncertainty.

Issued Date : 02-Feb-26

Calibration by : Mr.Parinya Chungklueng

Approved by :

Quality Assurance : Mr.Natthaphol Boonmee

Mr.Paitoon Chungklueng
Authorized Signatory



PN-Tech Instruments Co., Ltd.

100/64 Moo.6 T.Ladsawai R.Lamlukka Pathumthani 12150

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Email : info.pntinstruments@gmail.com, info@pntech-i.com



CALIBRATION REPORT

Certificate Number : PNT01-26-026-1

Page : 2 of 3

Standard Equipment Used

<u>Equip. No.</u>	<u>Equipment Name</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
PNS-043	Sound Level Calibrator	N949786	EL64654/24	23-Dec-26

Traceability

This certificate is traceable to the International System of Unit (SI Unit) maintained at ;

- Professional Calibration & Services Co., Ltd.



PN-Tech Instruments Co., Ltd.

100/64 Moo.6 T.Ladsawai R.Lamlukka Pathumthani 12150

Tel. 092-824-2461, 061-993-6478 www.pntech-i.com

Email : info.pntinstruments@gmail.com, info@pntech-i.com



CALIBRATION REPORT

Certificate Number : PNT01-26-026-1

Page : 3 of 3

Results of Calibration : (/) Without Adjustment () With Adjustment

Function : Sound Level Measurement : (Test Mode Slow)

UUC Range : 40 to 130 dB

Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.3	0.03	0.28
	114.30	114.1	-0.20	0.28
LC	94.27	94.3	0.03	0.28
	114.30	114.1	-0.20	0.28

Function : Sound Level Measurement : (Test Mode Fast)

UUC Range : 40 to 130 dB

Resolution : 0.1 dB

Function	Standard Value (dB)	UUC Reading (dB)	UUC Error (dB)	Uncertainty (±) (dB)
LA	94.27	94.3	0.03	0.28
	114.30	114.1	-0.20	0.28
LC	94.27	94.3	0.03	0.28
	114.30	114.1	-0.20	0.28

**** End of Certificate****



PACIFIC

LABORATORY CO., LTD.

Pacific Laboratory Co., Ltd.
 14/5358 Moo 14 Tambol Bang Bua Thong
 Amphoe Bang Bua Thong, Nonthaburi 11110
 Tel : 0-2045-2446-7 Fax : 0-2045-3991
 E-mail : pacificlab07@gmail.com
 www.pacificlaboratory.com
 Head office/Tax 0125550044098

Sound Level Meter Calibration Report

Calibrate No. : SLM 038/2569

Calibrate Date : June 4, 2026

Equipment : Sound Calibrator
 Manufacturer : Soundtek
 Model/Type : ST-120
 Serial No. : 211203764
 Sound Pressure Level : 94 and 114 dB
 Accuracy : $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
 Frequency : $1000\text{Hz} \pm 1\%$
 Customer Name : บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

Item	Instrument	Manufacturer	Model	Serial No.	Before Adjust	After Adjust	Inspection Result
1.	Sound Level Meter	ACO Co., Ltd.	6226	200045	94.3	94.0	Pass
					114.2	114.0	Pass
2.	Sound Level Meter	ACO Co., Ltd.	6226	100055	93.9	94.0	Pass
					113.9	114.0	Pass

Approved By


 (Miss Sakuna Supparot)
 Technician



PACIFIC

LABORATORY CO., LTD.

Pacific Laboratory Co., Ltd.
14/5358 Moo 14 Tambol Bang Bua Thong
Amphoe Bang Bua Thong, Nonthaburi 11110
Tel. : 0-2045-2446-7 Fax. : 0-2045-3991
E-mail : pacificlab07@gmail.com
www.pacificlaboratory.com
Head office/Tax 0125550044098

Sound Level Meter Calibration Report

Calibrate No. : SLM 042/2569

Calibrate Date : June 2, 2026

Equipment : Sound Calibrator
Manufacturer : Soundtek
Model/Type : ST-120
Serial No. : 211203764
Sound Pressure Level : 94 and 114 dB
Accuracy : $94 \pm 0.3\text{dB}$ and $114 \pm 0.5\text{dB}$
Frequency : $1000\text{Hz} \pm 1\%$
Customer Name : บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

Item	Instrument	Manufacturer	Model	Serial No.	Before Adjust	After Adjust	Inspection Result
1.	Sound Level Meter	ACO Co., Ltd.	6226	180045	93.9	94.0	Pass
					114.1	114.0	Pass
2.	Sound Level Meter	ACO Co., Ltd.	6226	200042	93.9	94.0	Pass
					113.7	114.0	Pass

Approved By


Sakuna S.
(Miss Sakuna Supparot)
Technician

Sound Level Meter Calibration Report

Calibrate No. : SLM 051/2569

Calibrate Date : June 12, 2026

Equipment	:	Sound Calibrator
Manufacturer	:	Soundtek
Model/Type	:	ST-120
Serial No.	:	211203764
Sound Pressure Level	:	94 and 114 dB
Accuracy	:	94 ± 0.3dB and 114 ± 0.5dB
Frequency	:	1000Hz ± 1%
Customer Name	:	บริษัท เดอะ แพลทินัม กรุ๊ป จำกัด (มหาชน)

[illegible]

Approved By


Sakuna S
(Miss Sakuna Supparot)
Technician

ภาคผนวกที่ 5-3
เอกสารสอบเทียบเครื่องมือตรวจวัดความสั่นสะเทือน



Professional Calibration & Services Co., Ltd.

50/888, 50/889 Moo 2, Rungsit-Nakornnayok Rd., Bungyeetha, Thunvaburi
Pathumthani 12130 Thailand
Tel : (+66)2150-6641 (Autoline)
Email : info@p-cal.com www.p-cal.com



Certificate of Calibration

Certificate Number : PL19535/25
Control Number : PCAL161551
Customer Control : -
Description : Vibration Meter
Manufacturer : Micromate
Model : 721A2901
Serial Number : UM13374
Customer : Stack Consulting Co.,Ltd.
14/3504-3505 Moo 14, T. Bang Bua Thong,
A. Bang Bua Thong, Nonthaburi 11110

Page 1 of 3



Date of Receipt : 04-Apr-25
Date of Calibration : 08-Apr-25
Environment : Temperature $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$
Relative Humidity $50\% \pm 20\%$
Calibration Method : Calibration Procedure Number CP-PL22
Calibration Results : See data attached

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%.

This certificate is issued in accordance with ISO/IEC17025 and the conditions of accreditation granted by the Accreditation Body which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. The results relate only to the item calibrated.

This certificate shall not be reproduced other than in full except without the prior written approval of the Head of Calibration Laboratory of Professional Calibration & Services Co., Ltd.

Calibrated By

Ms. Supattra Mungkasam

Authorized Signature

(Mr. Jumnong Junphong)

09-Apr-25

Issued Date

CALIBRATION REPORT

Professional Calibration & Services Co.,Ltd.

Certificate Number : PL19535/25

Page 2 of 3

Equipment Standards Used

Description	Serial No.	Traceability to	Certificate No.	Cal. Due Date
Vibration Calibrator	507221	ANAB : AC-2658	ENU300908	21-Oct-25

Condition as received : Normal

Definitions :-

* ANAB - The ANSI National Accreditation Board

CALIBRATION REPORT

Professional Calibration & Services Co., Ltd.

Certificate No.: PL19535/25

Page : 3 of 3

Calibration Results

Appearance and function of use:

Good

Results of Calibration:

☒ Without adjustment

☐ With adjustment

Details of Equipment:

Velocity @ 160 Hz (RMS)

Serial No. of Sensor:

UM13537

Resolution: 0.001 mm/s

Standard Value (mm/s)	UUC Reading (mm/s)	UUC Error (mm/s)	Uncertainty (± mm/s)
0.30	0.300	0.000	0.066
0.50	0.503	0.003	0.066
0.70	0.714	0.014	0.066
1.00	1.012	0.012	0.066
10.00	9.884	-0.116	0.24
20.00	19.871	-0.129	0.44
30.00	29.932	-0.068	0.63
40.00	39.711	-0.289	0.84
50.00	49.866	-0.134	1.1

...End...



Metrology and Calibration Department
Electrical Maintenance Division
Electricity Generating Authority of Thailand

81 Moo 11 Bangkruai - Sainoi Rd., Sainoi, Nonthaburi 11150 Tel. (662) 436-8789 Ext. 6155



Certificate of Calibration

Issued by : Vibration Laboratory

Certificate No. : 25V0033

Reference No. : CBLUE01V016

Received Date : 14 March 2025

Calibrated Date : 20 March 2025

Page 1 of 3

Client : Blue Consultant Limited Partnership

Address : 32/751 Pracha-uthit Rd.
Thungkhru Bangkok 10140

Equipment : VIBRATION METER

Manufacture /Brand : INSTANTEL

Model : Micromate

Serial No./ ID No. : UM8882

Bamrung Saengthien

(Mr. Bamrung Saengthien)

Authorized Signatory

Issue Date 21 March 2025

This certificate is issued in accordance with the conditions of accreditation granted by The National Accreditation Council of Thailand which has assessed the measurement capability of the laboratory and its traceability to recognised national standards and to the units of measurement realised at the corresponding national standards laboratory. This certificate may not be reproduced other than in full, except with the prior written approval of the head of Calibration services and environmental analysis department. This reported measurement result relates only the measurand and applies only at the time of measurement.

FM-02/QP-MCC-09 Rev.5

e-mail : MCC@egat.co.th



Metrology and Calibration Department
Electrical Maintenance Division
Electricity Generating Authority of Thailand

Continued of Calibration Report

Certificate No. 25V0033

Page 2 of 3

Reference Standard Used

Description	Manufacture/Model	Serial No.	Traceable No.	Due Date
Accelerometer Type 8305	Brue! & Kjaer	1262817	AV-0014-23	28 March 2025
Conditioning Amplifier Type 2635	Brue! & Kjaer	2371579	AV-0013-23	27 March 2025
Digital Multimeter /8846A	FLUKE	4330020	24E513	22 September 2025

Traceability

This certificate provides traceability of measurement to the International System of Units (SI) through

- National Institute of Metrology (Thailand) (NIMT)
- Metrology and Calibration Department (EGAT)

Environmental Conditions

The calibration was performed in an environment of $(23\pm 2)^{\circ}\text{C}$ and $(50\pm 10)\%\text{RH}$

Measurement Method

The unit under calibration was calibrated by comparison with standard accelerometer. The calibration method is based on ISO 16063-21 : 2003(E) by comparison with reference accelerometer standard .

Uncertainty of Measurement

The measurement uncertainty are labeled on the following pages completed the expanded uncertainty that calculated in accordance with the method to describe in M3003, using coverage factor $k=2$, The value of the measured lies within the assigned ranges the measured lies within the assigned ranges of values to a coverage probability of approximately 95%.

Tabulation of Results

The measurement results, labeled in the following pages give the calibration results and associated measurement uncertainties.



Metrology and Calibration Department
Electrical Maintenance Division
Electricity Generating Authority of Thailand

Continued of Calibration Report

Certificate No. 25V0033

Page 3 of 3

Measurement Results

DESCRIPTION Frequency (Hz)	STD Applied Value (mm/s _p)	UUC Reading (mm/s _p)	Uncertainty (± mm/s _p)	Direction
*20	10.00	10.39	0.15	Vertical (V)
*30	10.00	10.31	0.15	
40	10.00	10.20	0.15	
52	10.00	10.12	0.15	
63	10.00	10.07	0.15	
80	10.00	10.00	0.15	
*20	10.00	10.29	0.15	Transverse (T)
*30	10.00	10.32	0.15	
40	10.00	10.30	0.15	
52	10.00	10.26	0.15	
63	10.00	10.24	0.15	
80	10.00	10.21	0.15	
*20	10.00	10.29	0.15	Longitudinal (L)
*30	10.00	10.34	0.15	
40	10.00	10.33	0.15	
52	10.00	10.29	0.15	
63	10.00	10.28	0.15	
80	10.00	10.25	0.15	

Note

Tranducer Part : ENAB16145

Serial No. : -

Remark: * Measurement results outside the scope of accreditation.

End Certificate of Calibration



Professional Calibration & Services Co., Ltd.

50/888, 50/889 Moo 2, Rungsi-Nakomnayok Rd., Bungyeetho, Thunyaburi,
Pathumthani 12130 Thailand
Tel : (+66)2150-6641 (Autoline)
Email : info@p-cal.com www.p-cal.com



Certificate of Calibration

Certificate Number : PL19540/25
Control Number : PCAL161553
Customer Control : -
Description : Vibration Meter
Manufacturer : Micromate
Model : 721A3301
Serial Number : UM21809
Customer : Stack Consulting Co.,Ltd.
14/3504-3505 Moo 14, T. Bang Bua Thong,
A. Bang Bua Thong, Nonthaburi 11110
Date of Receipt : 04-Apr-25
Date of Calibration : 08-Apr-25
Environment : Temperature $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$
: Relative Humidity $50\% \pm 20\%$
Calibration Method : Calibration Procedure Number CP-PL22
Calibration Results : See data attached

Page 1 of 3



The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%.

This certificate is issued in accordance with ISO/IEC17025 and the conditions of accreditation granted by the Accreditation Body which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. The results relate only to the item calibrated.

This certificate shall not be reproduced other than in full except without the prior written approval of the Head of Calibration Laboratory of Professional Calibration & Services Co., Ltd.

Calibrated By

Ms. Supattra Mungkasm

Authorized Signature

(Mr. Jumnonng Junphong)

09-Apr-25

Issued Date

CALIBRATION REPORT

Professional Calibration & Services Co.,Ltd.

Certificate Number : PL19540/25

Page 2 of 3

Equipment Standards Used

Description	Serial No.	Traceability to	Certificate No.	Cal. Due Date
Vibration Calibrator	507221	ANAB : AC-2658	ENU300908	21-Oct-25

Condition as received : Normal

Definitions :-

* ANAB - The ANSI National Accreditation Board

CALIBRATION REPORT

Professional Calibration & Services Co., Ltd.

Certificate No.: PL19540/25

Page : 3 of 3

Calibration Results

Appearance and function of use:

Good

Results of Calibration:

☒ Without adjustment

☐ With adjustment

Details of Equipment:

Velocity @ 160 Hz (RMS)

Serial No. of Sensor:

UM21809

Resolution: 0.001 mm/s

Standard Value (mm/s)	UUC Reading (mm/s)	UUC Error (mm/s)	Uncertainty (± mm/s)
0.30	0.296	-0.004	0.066
0.50	0.506	0.006	0.066
0.70	0.711	0.011	0.066
1.00	1.019	0.019	0.066
10.00	9.903	-0.097	0.24
20.00	19.898	-0.102	0.44
30.00	29.956	-0.044	0.63
40.00	39.728	-0.272	0.84
50.00	49.894	-0.106	1.1

...End...



Metrology and Calibration Department
Electrical Maintenance Division
Electricity Generating Authority of Thailand

81 Moo 11 Bangkruai - Sainoi Rd., Sainoi, Nonthaburi 11150 Tel. (662) 436-8789 Ext. 6155



NSC-TISI-TIS 17025
CALIBRATION 0318

Certificate of Calibration

Issued by : Vibration Laboratory

Certificate No. : 25V0140

Reference No. : CPCFL01V001

Received Date : 21 November 2025

Calibrated Date : 28 November 2025

Page 1 of 3

Client : PACIFIC LABORATORY CO., LTD

Address : 14/5358 Moo 14 TAMBOL BANG BUA THONG
AMPHOE BANG BUA THONG NONTABURI 11110

Equipment : Vibration Meter

Manufacture /Brand : Instantel

Model : 721A2501/721A2901

Serial No./ ID No. : UM13202/UM13202

(Mr. Apichart Palatornpariruk)

Authorized Signatory

Issue Date. 2 December 2025

This certificate is issued in accordance with the conditions of accreditation granted by The National Accreditation Council of Thailand which has assessed the measurement capability of the laboratory and its traceability to recognised national standards and to the units of measurement realised at the corresponding national standards laboratory. This certificate may not be reproduced other than in full, except with the prior written approval of the head of Calibration services department. This reported measurement result relates only the measurand and applies only at the time of measurement.

FM-02/QP-MCC-09 Rev.6

e-mail : MCC@egat.co.th



Metrology and Calibration Department
Electrical Maintenance Division
Electricity Generating Authority of Thailand

Continued of Calibration Report

Certificate No. 25V0140

Page 2 of 3

Reference Standard Used

Description	Manufacture/Model	Serial No.	Traceable No.	Due Date
Accelerometer Type 8305	Bruel & Kjaer	1262817	AV-0018-25	20 April 2027
Conditioning Amplifier Type 2626	Bruel & Kjaer	1242376	AV-0004-25	06 March 2027
Digital Multimeter /8846A	FLUKE	4330020	25E0551	22 September 2026

Traceability

This certificate provides traceability of measurement to the International System of Units (SI) through

- National Institute of Metrology (Thailand) (NIMT)
- Metrology and Calibration Department (EGAT)

Environmental Conditions

The calibration was performed in an environment of $(23 \pm 2)^{\circ}\text{C}$ and $(50 \pm 10)\% \text{RH}$

Measurement Method

The unit under calibration was calibrated by comparison with standard accelerometer. The calibration method is based on WI-MCC-E-301.

Uncertainty of Measurement

The measurement uncertainty are labeled on the following pages completed the expanded uncertainty that calculated in accordance with the method to describe in M3003, using coverage factor $k=2$, The value of the measured lies within the assigned ranges the measured lies within the assigned ranges of values to a coverage probability of approximately 95%.

Tabulation of Results

The measurement results, labeled in the following pages give the calibration results and associated measurement uncertainties.



Metrology and Calibration Department
Electrical Maintenance Division
Electricity Generating Authority of Thailand

Continued of Calibration Report

Certificate No. 25V0140

Page 3 of 3

Measurement Results

DESCRIPTION		STD Applied Value	UUC Reading	Uncertainty
Frequency (Hz)	(mm/s _p)	(mm/s _p)	(mm/s _p)	(± mm/s _p)
160	10	10.00	9.88	0.14
160	20	20.00	19.62	0.28
160	30	30.00	29.32	0.42
160	40	40.00	39.15	0.55
160	50	50.00	49.13	0.69

End Certificate of Calibration



Metrology and Calibration Department
Electrical Maintenance Division
Electricity Generating Authority of Thailand

81 Moo 11 Bangkruai - Sainoi Rd., Sainoi, Nonthaburi 11150 Tel. (662) 436-8789 Ext. 6155



Certificate of Calibration

Issued by : Vibration Laboratory

Certificate No. : 25V0141

Reference No. : CPCFL01V002

Received Date : 21 November 2025

Calibrated Date : 01 December 2025

Page 1 of 3

Client : PACIFIC LABORATORY CO., LTD

Address : 14/5358 Moo 14 TAMBOL BANG BUA THONG
AMPHOE BANG BUA THONG NONTABURI 11110

Equipment : Vibration Meter

Manufacture /Brand : Instantel

Model : 721A2501/721A2901

Serial No./ ID No. : UM13203/UM13202

(Mr. Apichart Palatornpariruk)

Authorized Signatory

Issue Date 2 December 2025

This certificate is issued in accordance with the conditions of accreditation granted by The National Accreditation Council of Thailand which has assessed the measurement capability of the laboratory and its traceability to recognised national standards and to the units of measurement realised at the corresponding national standards laboratory. This certificate may not be reproduced other than in full, except with the prior written approval of the head of Calibration services department. This reported measurement result relates only the measurand and applies only at the time of measurement.



Metrology and Calibration Department
Electrical Maintenance Division
Electricity Generating Authority of Thailand

Continued of Calibration Report

Certificate No. 25V0141

Page 2 of 3

Reference Standard Used

Description	Manufacture/Model	Serial No.	Traceable No.	Due Date
Accelerometer Type 8305	Bruel & Kjaer	1262817	AV-0018-25	20 April 2027
Conditioning Amplifier Type 2626	Bruel & Kjaer	1242376	AV-0004-25	06 March 2027
Digital Multimeter /8846A	FLUKE	4330020	25E0551	22 September 2026

Traceability

This certificate provides traceability of measurement to the International System of Units (SI) through

- National Institute of Metrology (Thailand) (NIMT)
- Metrology and Calibration Department (EGAT)

Environmental Conditions

The calibration was performed in an environment of $(23 \pm 2)^{\circ}\text{C}$ and $(50 \pm 10)\%\text{RH}$

Measurement Method

The unit under calibration was calibrated by comparison with standard accelerometer. The calibration method is based on WI-MCC-E-301.

Uncertainty of Measurement

The measurement uncertainty are labeled on the following pages completed the expanded uncertainty that calculated in accordance with the method to describe in M3003, using coverage factor $k=2$. The value of the measured lies within the assigned ranges the measured lies within the assigned ranges of values to a coverage probability of approximately 95%.

Tabulation of Results

The measurement results, labeled in the following pages give the calibration results and associated measurement uncertainties.



Metrology and Calibration Department
Electrical Maintenance Division
Electricity Generating Authority of Thailand

Continued of Calibration Report

Certificate No. 25V0141

Page 3 of 3

Measurement Results

DESCRIPTION		STD Applied Value	UUC Reading	Uncertainty
Frequency (Hz)	(mm/s _p)	(mm/s _p)	(mm/s _p)	(± mm/s _p)
160	10	10.00	9.86	0.14
160	20	20.00	19.51	0.28
160	30	30.00	29.12	0.41
160	40	40.00	39.01	0.55
160	50	50.00	49.17	0.69

End Certificate of Calibration



Professional Calibration & Services Co., Ltd.

50/888, 50/889 Moo 2, Rungsit-Nakornnayok Rd., Bungyeetho, Thunyaburi,
Pathumthani 12130 Thailand
Tel : (+66)2150-6641 (Autoline)
Email : info@p-cal.com www.p-cal.com



Certificate of Calibration

Certificate Number : PL19537/25
Control Number : PCAL161552
Customer Control : -
Description : Vibration Meter
Manufacturer : Micromate
Model : 721A2901
Serial Number : UM13537
Customer : Stack Consulting Co.,Ltd.
14/3504-3505 Moo 14, T. Bang Bua Thong,
A. Bang Bua Thong, Nonthaburi 11110

Page 1 of 3



Date of Receipt : 04-Apr-25
Date of Calibration : 08-Apr-25
Environment : Temperature $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$
: Relative Humidity $50\% \pm 20\%$
Calibration Method : Calibration Procedure Number CP-PL22
Calibration Results : See data attached

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%.

This certificate is issued in accordance with ISO/IEC17025 and the conditions of accreditation granted by the Accreditation Body which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. The results relate only to the item calibrated.

This certificate shall not be reproduced other than in full except without the prior written approval of the Head of Calibration Laboratory of Professional Calibration & Services Co., Ltd.

Calibrated By

Ms. Supattra Mungkasm

Authorized Signature

(Mr. Jumnong Junphong)

09-Apr-25

Issued Date

CALIBRATION REPORT

Professional Calibration & Services Co.,Ltd.

Certificate Number : PL19537/25

Page 2 of 3

Equipment Standards Used

Description	Serial No.	Traceability to	Certificate No.	Cal. Due Date
Vibration Calibrator	507221	ANAB : AC-2658	ENU300908	21-Oct-25

Condition as received : Normal

Definitions :-

* ANAB - The ANSI National Accreditation Board

CALIBRATION REPORT

Professional Calibration & Services Co., Ltd.

Certificate No.: PL19537/25

Page : 3 of 3

Calibration Results

Appearance and function of use: Good

Results of Calibration: ☒ Without adjustment ☐ With adjustment

Details of Equipment: Velocity @ 160 Hz (RMS)

Serial No. of Sensor: UM13374

Resolution: 0.001 mm/s

Standard Value (mm/s)	UUC Reading (mm/s)	UUC Error (mm/s)	Uncertainty (± mm/s)
0.30	0.298	-0.002	0.066
0.50	0.502	0.002	0.066
0.70	0.708	0.008	0.066
1.00	1.014	0.014	0.066
10.00	9.891	-0.109	0.24
20.00	19.892	-0.108	0.44
30.00	29.947	-0.053	0.63
40.00	39.714	-0.286	0.84
50.00	49.882	-0.118	1.1

...End...

ภาคผนวกที่ 5-4

เอกสารสอบเทียบเครื่องมือตรวจวิเคราะห์คุณภาพน้ำ

Certificate of Calibration

Certificate No. : 68-420062-1

Page : 1 of 2

Submitted by : Pacific Laboratory Co., Ltd.

14/5358 Moo 14, T. Bang Bua Thong, A. Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : pH Meter with electrode

pH meter

Manufacturer : Eutech

Model : pH 700

Range : N/A pH

Resolution : 0.01 pH

Serial No. : 2841305

ID No. : LAB-PH-002

Electrode

Model : N/A

Serial No. : 3172493

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co., Ltd.

Ambient Temperature : (23.5 to 25.0)° C

Relative Humidity : (50 to 55) %

Date of Received : 21 July 2025

Date of Calibration : 21 July 2025

Date of Issue : 24 July 2025

Calibrated by : Permpon Chanpu

Calibration Method : In-house method CAL-M4201 direct measurement by using standard voltage calibrator and using certified reference material (CRM)

Reference Standard Instruments : This certification is traceable to the International System of Units

1. Multiproduct Calibrator

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
400005	SG-E-00307/66	23 Aug 2025	National Institute of Metrology Thailand (NIMT)

2. Standard Buffer Solution

<u>pH</u>	<u>Cert. No.</u>	<u>Lot No.</u>	<u>Exp. Date</u>	<u>Traceability</u>
4.007	61314276	1081108	28 Feb 2027	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
6.965	61318175	1081110	28 Feb 2026	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
10.010	61325043	1081109	28 Feb 2026	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025

Approved by :



(Permpon Chanpu)

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 68-420062-1

Page : 2 of 2

Result of Calibration :

UUC Condition As-Received : Good

Function : Electrical measurement

pH meter

Performing standard curve by Multiproduct Calibrator at pH (4,7,10)

Adjustment Curve at nominal pH	Applied Voltage (mV)	Nominal Value (pH)	UUC Reading		Correction (mV)	Uncertainty (± mV)
			(pH)	(mV)		
4, 7, 10	177.4800	4	4.00	177.5	0.0	0.12
	0.0000	7	7.00	0.1	-0.1	0.086
	-177.4800	10	10.00	-177.4	-0.1	0.12

Function : pH meter with electrode

Performing a three - buffer standard curve using buffer nominal pH (4,7,10)

Adjustment Curve at nominal pH	Standard Buffer (pH)	UUC Reading (pH)	Correction (pH)	Uncertainty (± pH)
4, 7, 10	4.007	4.01	0.00	0.0097
	6.965	7.00	-0.03	0.011
	10.010	10.01	0.00	0.014

Remark

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurment was based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%

- o0o -



Certificate of Calibration

Certificate No. : 68-420062-2

Page : 1 of 2

Submitted by : Pacific Laboratory Co., Ltd.

14/5358 Moo 14, T. Bang Bua Thong, A. Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : pH Meter with electrode

pH meter

Manufacturer : Eutech

Model : pH 700

Range : N/A pH

Resolution : 0.01 pH

Serial No. : 2841305

ID No. : LAB-PH-002

Electrode

Model : N/A

Serial No. : 3052953

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co., Ltd.

Ambient Temperature : (23.5 to 25.0)° C

Relative Humidity : (50 to 55) %

Date of Received : 21 July 2025

Date of Calibration : 21 July 2025

Date of Issue : 24 July 2025

Calibrated by : Permpon Chanpu

Calibration Method : In-house method CAL-M4201 direct measurement by using standard voltage calibrator and using certified reference material (CRM)

Reference Standard Instruments : This certification is traceable to the International System of Units

1. Multiproduct Calibrator

ID No.	Cert. No.	Due Date	Traceability
400005	SG-E-00307/66	23 Aug 2025	National Institute of Metrology Thailand (NIMT)

2. Standard Buffer Solution

pH	Cert. No.	Lot No.	Exp. Date	Traceability
4.007	61314276	1081108	28 Feb 2027	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
6.965	61318175	1081110	28 Feb 2026	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
10.010	61325043	1081109	28 Feb 2026	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025

Approved by :



(Permpon Chanpu)

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 68-420062-2

Page : 2 of 2

Result of Calibration :

UUC Condition As-Received : Good

Function : Electrical measurement

pH meter

Performing standard curve by Multiproduct Calibrator at pH (4,7,10)

Adjustment Curve at nominal pH	Applied Voltage (mV)	Nominal Value (pH)	UUC Reading		Correction (mV)	Uncertainty (± mV)
			(pH)	(mV)		
4, 7, 10	177.4800	4	4.00	177.5	0.0	0.12
	0.0000	7	7.00	0.1	-0.1	0.086
	-177.4800	10	10.00	-177.4	-0.1	0.12

Function : pH meter with electrode

Performing a three - buffer standard curve using buffer nominal pH (4,7,10)

Adjustment Curve at nominal pH	Standard Buffer (pH)	UUC Reading (pH)	Correction (pH)	Uncertainty (± pH)
4, 7, 10	4.007	4.01	0.00	0.0097
	6.965	7.00	-0.03	0.011
	10.010	10.01	0.00	0.014

Remark

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%

- 000 -



Certificate of Calibration

Certificate No. : 68-400421-1

Page : 1 of 2

Submitted by : Pacific Laboratory Co., Ltd.

14/5358 Moo 14, T. Bang Bua Thong, A. Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : Temperature Indicator with Thermistor Probe

Temperature Indicator

Manufacturer : Eutech

Model : pH 700

Range : N/A °C

Resolution : 0.1 °C

Serial No. : 2841305

ID No. : LAB-PH-002

Thermistor probe

Model : N/A

Sheath Material : Stainless

Diameter : 3 mm.

Length : 115 mm.

Serial No. : PHSTEMB01P 049

ID No. : LAB-PH-002

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co., Ltd.

Ambient Temperature : (23.5 to 25.0) °C

Relative Humidity : (50 to 55) %

Line Voltage : (220.0 to 221.0) VAC

Date of Received : 21 July 2025

Date of Calibration : 21 July 2025

Date of Issue : 24 July 2025

Calibrated by : Permpon Chanpu

Calibration Method : This instrument was calibrated by In-house method comparison technique CAL-M4003 by compared with PRT in the liquid bath at the constant controlled temperature.

The temperature scale used was based on ITS-90

Reference Standard Instruments : This certification is traceable to the International System of Units

1. Platinum Resistance Thermometer (PRT)

ID No.	Cert. No.	Due Date	Traceability
400016	TT-1019-25	13 May 2027	National Institute of Metrology Thailand (NIMT)

2. Standard Digital Thermometer

ID No.	Cert. No.	Due Date	Traceability
400033	24E633	21 Feb 2026	National Institute of Metrology Thailand (NIMT)

Approved by :



(Permpon Chanpu)

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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CAL

Calibratech Co.,Ltd.

7/106-7 Moo 2, Sukhaprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com

Certificate of Calibration

Certificate No. : 68-400421-1

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement

Immersion Depth (mm.)	Standard Reading (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (± °C)
115	25.002	24.9	0.1	0.19

Remark

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%

- ๐0๐ -



CAL

Calibratech Co.,Ltd.

7/106-7 Moo 2, Sukhprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com



NSC-TISI-TIS 17025
CALIBRATION 0030

Certificate of Calibration

Certificate No. : 68-400420-3

Page : 1 of 2

Submitted by : Pacific Laboratory Co., Ltd.
14/5358 Moo 14, T. Bang Bua Thong, A. Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : Temperature controlled enclosure (Incubator)
Manufacturer : Aqua Lytic Model : TC 135S
Range : N/A °C Resolution : 0.1 °C
Serial No. : 0614/000033 ID No. : LAB-IB-001

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co., Ltd.
Ambient Temperature : (23.0 to 24.5) °C
Relative Humidity : (40 to 45) %
Line Voltage : (220.0 to 222.0) V

Date of Received : 21 July 2025

Date of Calibration : 21 July 2025

Date of Issue : 24 July 2025

Calibrated by : Permpon Chanpu

Calibration Method : CAL-M4004, TLAS G-20
The temperature scale used was based on ITS-90

Reference Standard Instruments : This certification is traceable to the International System of Units
Standard Digital Thermometer with RTD Probe

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
400029 & 400048	68-400063-1	01 Aug 2025	National Institute of Metrology Thailand (NIMT)

Approved by :

(Permpon Chanpu)

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full except with the prior written approval of the Calibratech Co.,Ltd.



Certificate of Calibration

Certificate No. : 68-400420-3

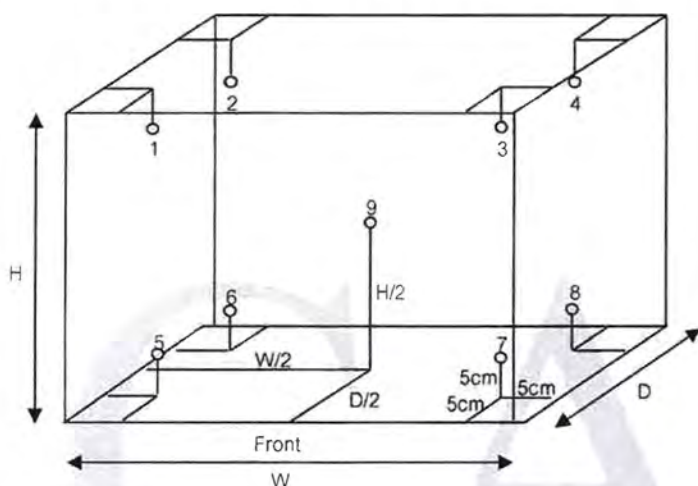
Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement

This instrument was setting air ventilation at position 0 (close)



Inside of Chamber

W = 0.51 m

D = 0.04 m

H = 0.70 m

Capacity = 0.02 m³

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty (± °C)
			1	2	3	4	5	6	7	8	9	
20.0	20.5	20.5	20.10	19.94	19.99	19.96	19.92	19.90	20.02	19.99	19.87	0.69

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
20.0	20.5	20.5	0.43	0.36	0.78

Remark The uncertainty is not combine uniformity of the air chamber

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%

- o0o -

[Signature]



CAL

Calibratech Co.,Ltd.

7/106-7 Moo 2, Sukhprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com



NSC-TISI-TIS 17025
CALIBRATION 0030

Certificate of Calibration

Certificate No. : 68-400420-2

Page : 1 of 2

Submitted by : Pacific Laboratory Co., Ltd.

14/5358 Moo 14, T. Bang Bua Thong, A. Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : Water Bath

Manufacturer : Memmert

Model : WNB 22

Range : N/A °C

Resolution : 0.1 °C

Serial No. : L514.0184

ID No. : LAB-WB-001

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co., Ltd.

Ambient Temperature : (31.0 to 31.8) °C

Relative Humidity : (50 to 55) %

Line Voltage : (220.0 to 222.0) V

Date of Received : 21 July 2025

Date of Calibration : 21 July 2025

Date of Issue : 24 July 2025

Calibrated by : Permpon Chanpu

Calibration Method : This instrument was calibrated by In-house method CAL-M4006 based on ASTM E715-80
The temperature scale used was based on ITS-90

Reference Standard Instruments : This certification is traceable to the International System of Units
Standard Digital Thermometer with RTD probe

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
400029 & 400031	68-400214-1	25 Oct 2025	National Institute of Metrology Thailand (NIMT)

Approved by :

(Permpon Chanpu)

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

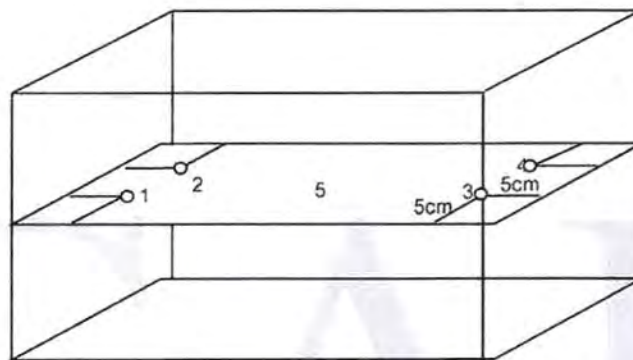
Certificate No. : 68-400420-2

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement



Front

Test Point (° C)	Setting Temperature (° C)	Indicating Temperature (° C)	Measured Temperature (° C) @					Uncertainty (± " C)	Measured Uniformity (° C)	Measured Stability (° C)
			Sensor No.							
			1	2	3	4	5			
65.0	65.0	65.0	64.62	64.64	64.64	64.63	64.63	0.18	0.05	0.03
95.0	95.0	95.0	94.60	94.61	94.63	94.68	94.58	0.18	0.17	0.05

Remark The uncertainty is not combine uniformity of the water bath

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%

- o0o -



CAL

Calibratech Co.,Ltd.

7/106-7 Moo 2, Sukhprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com



Certificate of Calibration

Certificate No. : 68-400420-1

Page : 1 of 2

Submitted by : Pacific Laboratory Co., Ltd.

14/5358 Moo 14, T. Bang Bua Thong, A. Bang Bua Thong, Nonthaburi 11110 Thailand

Equipment : Temperature controlled enclosure (Oven)

Manufacturer : Memmert

Model : UN 55

Range : N/A °C

Resolution : 0.1 °C

Serial No. : B214.1879

ID No. : LAB-OV-001

Environment : On site calibration was carried out at the Laboratory, Pacific Laboratory Co., Ltd.

Ambient Temperature : (31.0 to 31.8) °C

Relative Humidity : (50 to 55) %

Line Voltage : (220.0 to 222.0) V

Date of Received : 21 July 2025

Date of Calibration : 21 July 2025

Date of Issue : 24 July 2025

Calibrated by : Permpon Chanpu

Calibration Method : CAL-M4004, TLAS G-20

The temperature scale used was based on ITS-90

Reference Standard Instruments : This certification is traceable to the International System of Units
Standard Digital Thermometer with Thermocouple probe

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
400029 & 400032	68-400217-1	28 Oct 2025	National Institute of Metrology Thailand (NIMT)

Approved by :

(Permpon Chanpu)

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full except with the prior written approval of the Calibratech Co.,Ltd.





SCIMET Co., Ltd.
818/124 Udomsuk Rd., Bangna-Nuea,
Bangna, Bangkok 10260 Thailand
Email:scimet2022@gmail.com, Tel: 02 460 9239
https://www.scimet.co.th



Certificate No. C07250105

Calibration Certificate

Equipment: SPECTROPHOTOMETER

Model: DR3900

Serial No.(or ID): 2076219 (LAB-ST-002)

Manufacturer: HACH

Condition: In Condition

Job No.: KSMT2502636

Received Date: 30 June 2025

Issued Date: 01 July 2025

Page: 1 of 3

Customer

Pacific Laboratory Co., Ltd.

14/5358 Moo 14, Bang Bua Thong, Bang Bua Thong, Nonthaburi 11110 Thailand

Calibration Place

Environment Laboratory, SCIMET Co., Ltd.

818/124 Udomsuk Rd., Bangna-Nuea, Bangna, Bangkok 10260 Thailand

Calibration Date

01 July 2025

Environment Condition

Temperature: 23 °C ± 2 °C

Humidity: 50 %RH ± 15 %RH

The Method used

In-house method, WI07, based on ASTM E 275-08 and
ASTM E 387-04

Traceability

This certificate is traceable to the CRM maintained by National Institute
of Standards and Technology (NIST) through Starna Scientific Limited.

The standard for Wavelength Certificate No. 128819 and 128820

The standard for Photometric Certificate No. 129803

This certificate is issued the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognized national standard laboratories.

The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor ($k=2$) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM).

These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of SCIMET Co., Ltd.

(Mr. Dumrong Boonsopon)

Person in charge



(Mr. Thalerngkeat Pounngam)

Authorized signatory

Condition of reference standards Instruments / CRM:

<u>Instruments</u>	<u>Set No.</u>	<u>Certificate No.</u>	<u>Due date</u>
Holmium Oxide Glass Reference	121512	128819	3-Feb-27
Didymium Oxide Glass Reference	119722	128820	3-Feb-27
Neutral Density Filter Reference	12276	129803	6-Mar-27

Calibration Results:

Without Adjustment

Wavelength Accuracy (nm), The spectral bandwidth of Std at 5 nm and UUC at 5 nm

Standard Wavelength (nm)	Unit Under Calibration (nm)	Correction (nm)	Uncertainty of Measurement (± nm)
361.02	360	1.02	0.59
417.80	417	0.80	0.59
441.29	441	0.29	0.59
471.51	471	0.51	0.59
479.88	480	-0.12	0.59
513.75	513	0.75	0.59
528.59	528	0.59	0.59
537.75	537	0.75	0.59
585.56	585	0.56	0.59
641.95	642	-0.05	0.59
684.70	684	0.70	0.59
747.61	747	0.61	0.59
807.04	807	0.04	0.59
879.68	879	0.68	0.59

Calibration Results:

Without Adjustment

Photometric Accuracy (Absorbance)

Wavelength	Standard absorbance (Abs)	Unit Under Calibration (Abs)	Correction (Abs)	Uncertainty of Measurement($\pm$ Abs)
420 nm	0.0000	0.000	0.0000	0.0045
	0.2361	0.234	0.0021	0.0045
	0.5632	0.561	0.0022	0.0045
	0.7400	0.736	0.0040	0.0045
	1.0592	1.056	0.0032	0.0056
440 nm	0.0000	0.000	0.0000	0.0045
	0.2324	0.230	0.0024	0.0045
	0.5529	0.551	0.0019	0.0045
	0.7240	0.721	0.0030	0.0045
	1.0366	1.032	0.0046	0.0056
465 nm	0.0000	0.000	0.0000	0.0045
	0.2117	0.211	0.0007	0.0045
	0.5055	0.506	-0.0005	0.0045
	0.6747	0.674	0.0007	0.0045
	0.9658	0.965	0.0008	0.0057
546.1 nm	0.0000	0.000	0.0000	0.0045
	0.2194	0.218	0.0014	0.0045
	0.5199	0.520	-0.0001	0.0045
	0.6934	0.693	0.0004	0.0045
	0.9944	0.992	0.0024	0.0050
590 nm	0.0000	0.000	0.0000	0.0045
	0.2434	0.242	0.0014	0.0045
	0.5548	0.554	0.0008	0.0045
	0.7199	0.718	0.0019	0.0045
	1.0332	1.030	0.0032	0.0045
635 nm	0.0000	0.000	0.0000	0.0045
	0.2636	0.262	0.0016	0.0045
	0.5388	0.539	-0.0002	0.0045
	0.6866	0.686	0.0006	0.0045
	0.9852	0.983	0.0022	0.0045

The End of Certificate

Statements of conformity:

This conformity certificate documents the validity of the following statements of conformity based on the measurement results of corresponding calibration certificate:

The error of temperature determined during calibration are under given measurement and environmental conditions and considering the expanded measurement uncertainty (coverage probability 95%) within the specification. The given measurement uncertainty already includes other all effects by according to the standard method, ASTM E 275-08 and ASTM E 387-04. Therefore, those parameters have not been assessed separately.

Tolerance and Decision rules:

Assessment of the conformity of the measurement device are done based on direct comparison of the relevant measurement results with the tolerances and decision rule are prescribed by the customer.

- Decision rule :** ☐ Choice A Binary Statement for Simple Acceptance Rule ($w = 0$), Specific Risk $< 50\%$ PFA.
- ☒ Choice B Non-binary statement with guard band ($w = 1 U$), Pass or Fail Specific Risk $< 2.5\%$ PFA and Condition Pass or Condition Fail Specific Risk $< 50\%$ PFA.
- ☐ Choice C Customer defined, Customers may define arbitrary multiple of r to have applied as guard band ($w = r U$).
- ; PFA – Probability of False Accept



(Mr. Thalerngkeat Pongngam)

Authorized signatory



Without Adjustment

Wavelength Accuracy (nm), The spectral bandwidth of Std at 5 nm and UUC at 5 nm

Unit Under Calibration	Correction	Guard Band (w)	Tolerance (±)	Conformity
360	1.02	0.59	2.0	Pass
417	0.80	0.59	2.0	Pass
441	0.29	0.59	2.0	Pass
471	0.51	0.59	2.0	Pass
480	-0.12	0.59	2.0	Pass
513	0.75	0.59	2.0	Pass
528	0.59	0.59	2.0	Pass
537	0.75	0.59	2.0	Pass
585	0.56	0.59	2.0	Pass
642	-0.05	0.59	2.0	Pass
684	0.70	0.59	2.0	Pass
747	0.61	0.59	2.0	Pass
807	0.04	0.59	2.0	Pass
879	0.68	0.59	2.0	Pass

Without Adjustment

####					
Wavelength	Unit Under Calibration	Correction	Guard Band (w)	Tolerance ($\pm$)	Conformity
420 nm	0.000	0.0000	0.0045	0.015	Pass
	0.234	0.0021	0.0045	0.015	Pass
	0.561	0.0022	0.0045	0.015	Pass
	0.736	0.0040	0.0045	0.015	Pass
	1.056	0.0032	0.0056	0.015	Pass
440 nm	0.000	0.0000	0.0045	0.015	Pass
	0.230	0.0024	0.0045	0.015	Pass
	0.551	0.0019	0.0045	0.015	Pass
	0.721	0.0030	0.0045	0.015	Pass
	1.032	0.0046	0.0056	0.015	Pass
465 nm	0.000	0.0000	0.0045	0.015	Pass
	0.211	0.0007	0.0045	0.015	Pass
	0.506	-0.0005	0.0045	0.015	Pass
	0.674	0.0007	0.0045	0.015	Pass
	0.965	0.0008	0.0057	0.015	Pass
546.1 nm	0.000	0.0000	0.0045	0.015	Pass
	0.218	0.0014	0.0045	0.015	Pass
	0.520	-0.0001	0.0045	0.015	Pass
	0.693	0.0004	0.0045	0.015	Pass
	0.992	0.0024	0.0050	0.015	Pass
590 nm	0.000	0.0000	0.0045	0.015	Pass
	0.242	0.0014	0.0045	0.015	Pass
	0.554	0.0008	0.0045	0.015	Pass
	0.718	0.0019	0.0045	0.015	Pass
	1.030	0.0032	0.0045	0.015	Pass
635 nm	0.000	0.0000	0.0045	0.015	Pass
	0.262	0.0016	0.0045	0.015	Pass
	0.539	-0.0002	0.0045	0.015	Pass
	0.686	0.0006	0.0045	0.015	Pass
	0.983	0.0022	0.0045	0.015	Pass

The validity of the statements of conformity cannot be guaranteed for different places of use, environmental conditions or improper use.

The End of Statements of Conformity



ใบตรวจสอบสภาพเครื่อง Spectrophotometer

เลขที่ใบงาน: KSMT2502636

ชนิดเครื่องมือ: SPECTROPHOTOMETER

รุ่น: DR3900

หมายเลขเครื่อง: 2076219

ตรวจสอบ (รับ)		รายการตรวจเช็ค	ตรวจสอบ (ส่ง)		หมายเหตุ
30 Jun 2025			01 Jul 2025		
ปกติ	ไม่ปกติ		ปกติ	ไม่ปกติ	
☒	☐	1. ความสมบูรณ์เครื่อง	☒	☐	
☒	☐	2. ความสะอาด (ช่องใส่ตัวอย่าง, ภายใน-นอกเครื่อง)	☒	☐	
☒	☐	3. สวิทช์ ปิด – เปิด เครื่อง (On-Off Swicth)	☒	☐	
☒	☐	4. ปุ่มกด (Keypad)	☒	☐	
☒	☐	5. หน้าจอ (Display, Screen Contrast)	☒	☐	
☐	☐	6. ตัวหมุนเลือกความยาวคลื่น (Wavelength Control)	☐	☐	-
☒	☐	7. ความยาวคลื่น (Wavelength Check)	☒	☐	807.0nm=806.4nm
☐	☐	8. แหล่งกำเนิดแสง (UV < 3,000 hour)	☐	☐	-
☒	☐	9. แหล่งกำเนิดแสง (Visible < 5,000 hour)	☒	☐	
☐	☐	10. ช่องวัดหลายตัวอย่าง (Carousel Module)	☐	☐	-

เพิ่มเติม/ข้อแนะนำ :

Mr. Dumrong Boonsopon

Service Engineer