

ภาคผนวก จ

เอกสารสอบเทียบเครื่องมือ



Calibratech Co., Ltd.

7/06-7 Moo 2, Sakpaekhaun 3 Rd., Banggood, Pakkred, Nonthaburi 11120
Tel: (02) 964-4211 Fax: (02) 964-4155 e-mail: calibratech.co@yahoocom, calibratech.co@hotmail.com

Certificate of Calibration

Certificate No. : 68-410119-1

UUC Condition As Received : Good

Result of Calibration : Without Adjustment

Function : Temperature measurement

Reference Humidity @ 50 %R.H.

Standard Temperature (°C)	UUC Reading (°C) -	Correction (°C)	Uncertainty (± °C)
25.00	24.9	0.1	0.46

Result of Calibration :

Function : Humidity measurement

Reference Temperature @ 25 °C

Standard Humidity (%R.H.)	UUC Reading (%R.H.)	Correction (%R.H.)	Uncertainty (± %R.H.)
50.0	57.6	-7.6	2.2

Page : 2 of 2

SLECCO

บริษัท สเล็คโก้ จำกัด	หน้าที่ : 1 / 1
แบบบันทึกการสอบอุณหภูมิห้อง Block Digestion	วันที่ขึ้นบัญชี : 01 / 04 / 2563

1. Block Digestion

ผู้ผลิต : HANON รุ่น : SH229E Serial No. SH229013 รหัสเครื่อง : LB-60-01
วันที่ขึ้นบัญชี : 31.1.2563 หมายเลขเครื่อง : 2.1.1.2530

2. Digital Thermometer with TC Probe

ผู้ผลิต : Digma Scientific รุ่น : Diga ๗.๕ Serial No. 4100158 รหัสเครื่อง : LB-60-013
ความละเอียด : 0.1 °C วันที่ขึ้นบัญชี : 30.1.2023 เลขที่ขึ้นบัญชี : 21.1.1.2023

3. ผลการตรวจสอบ (จำนวน) ๐๙.๐๐ ๗. - ๖๓.๖๐ ๗.

อุณหภูมิห้อง : ๒๕.๐๐ ± ๐.๑ °C ความชื้นสัมพัทธ์ : ๕๓.๐๐ ± ๐.๑ %

วันที่	Position No.	Set point (°C)	อุณหภูมิ อ่านค่า (°C)	อุณหภูมิที่อ่านได้จริงในสโตร์ (°C)		Error	เกณฑ์ ยอมรับ	สรุปผลการ สอบ		ผู้ ตรวจสอบ
				ครั้งที่ 1 (A)	ครั้งที่ 2 (B)			ผ่าน	ไม่ผ่าน	
๑๓/๑๔	1	25.0	25.0	24.9	24.9	-0.1	±5	✓		[Signature]
	2			250.7	250.9	0.6	±5	✓		
	3			251.2	251.4	1.2	±5	✓		
	4			250.9	250.4	0.6	±5	✓		
	5			251.1	251.8	1.4	±5	✓		
	6			251.4	251.8	1.6	±5	✓		
	7			250.9	250.4	0.6	±5	✓		
	8			250.3	250.3	0.7	±5	✓		
	9			251.0	250.9	1.0	±5	✓		
	10			250.6	250.3	0.3	±5	✓		

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ISO 17025
CAL-0047-CV-0026

Certificate of Calibration

Certificate No. : 68-300307-6

Page : 1 of 2

Submitted by

: Special Lab Envi and Consultant Co., Ltd.

47/91-93 Moo 3, Tambol Tha-B, Pakkret, Nonthaburi 11120

Equipment

: Burette

Manufacturer : Wileg

Class : A

Capacity : 25 ml

Graduation : 0.05 ml

ID No. : LB-Gw-001

Environment

: Ambient Temperature : (20 ± 3) °C

Relative Humidity : (50 ± 10) %

Air Pressure : 1009.5 mbar.

Date of Received

: 19 April 2025

Date of Calibration

: 25 April 2025

Date of Issue

: 25 April 2025

Calibrated by

: Areeart Sorribun

Calibration Method : In-house method CAL-M3001 based on ASTM E 542-22

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

Electronic Balance

ID No.

Cert. No.

Due Date

Traceability

241005

67-200410-4

02 Jun 2025

National Institute of Metrology (Thailand) (NIMT)

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Certificate of Calibration

Certificate No. : 68-300307-6

Page : 2 of 2

Result of Calibration :

This result of true Volume is referred to standard temperature at 20 °C

U.U.C Condition As-Received : Good

Delivery Time : 40.04 sec.

Nominal Volume (ml)	Measuring Volume (ml)
10	10.0003
20	20.0098
25	25.0101

Uncertainty of measurement with in ± 0.0066 ml

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 = 2.00 ,

providing a level of confidence of approximately 95%

-oOo-

National Institute of Metrology Thailand (NIMT)

Test Point	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.					Uncertainty (± °C)	Measured Uniformity (°C)	Measured Stability (°C)
			1	2	3	4	5			
62.0	62.0	62.0	62.03	62.05	62.01	62.04	62.00	0.19	0.17	0.07
85.0	85.0	85.0	84.92	84.76	84.94	84.85	84.86	0.20	0.16	0.08
95.0	95.0	95.0	94.78	94.73	94.88	94.82	94.82	0.19	0.15	0.07
100.0	CCC	101.0	100.58	100.61	100.57	100.57	100.63	0.24	0.21	0.12

Remark The uncertainty is not combine uniformity of the water bath

This result of collection time found amongst researchers (e.g., *Wang et al., 2006*)



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Certificate No. : CAL-25-243

Page : 1 of 3

CERTIFICATE OF CALIBRATION

Equipment : Spectrophotometer
Manufacturer : Thermo Scientific
Model : Genesys 20
Serial No. : 3SGT041007
ID No. : LB-Eq-029
Customer : Special Lab Envi And Consultant Co.,Ltd.
: 47/91-93 Moo 3, Tambol Tail,
: Amphur Pakrad, Nonthaburi, 11120
Location : Becthai Laboratory
Date of Receipt : 30 April 2025
Date of Calibration : 2 May 2025
Date of Issue : 2 May 2025
Ambient Temperature : (25±10) °C
Relative Humidity : (60±20) %
Condition As-Received : Used Item



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Certificate No. : CAL-25-243

Page : 2 of 3

CALIBRATION REPORT

Conditions of this result of calibration

1. Reference Standard Material :

Material	Model	Serial No.	Cert.No.	Due date
Holmium Glass Filter	RM-HG	12705	117342	13 December 2025
Neutral Density Filter	RM-1N2KN	8323	117341	13 December 2025

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

The Sama Scientific Ltd. Accredited Calibration Laboratory No. 0659.

3. Method of calibration :

The calibration procedure was carried out according to ASTM E275-08 (2022) and ASTM E925-09 (2014).

4. Result of calibration :

(✓) without adjustment

() after adjustment

5. Equipment Specifications:



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Certificate No. : CAL-25-243

Page : 3 of 3

CALIBRATION REPORT

Wavelength Calibration

Certified Values of Reference Material	Nominal Value (nm)	UUC*Reading (nm)	Error (nm)	Uncertainty of Measurement ($\pm$ nm)	k Factor
418.40	418	418	-0.40	0.59	2.00
537.00	537	537	0.00	0.59	2.00
638.00	638	638	0.00	0.59	2.00

Photometric Calibration for Visible

Wavelength (nm)	Certified Values of Reference Material (A)	UUC* Reading (A)	Error (A)	Uncertainty of Measurement ($\pm$ A)	k Factor
420.0	Zero	0.000	0.0000	0.0028	2.00
	0.5703	0.573	0.0027	0.0045	2.00
	0.7336	0.739	0.0054	0.0045	2.00
	1.0709	1.074	0.0031	0.0045	2.00
440.0	Zero	0.000	0.0000	0.0028	2.00
	0.5522	0.561	0.0018	0.0045	2.00
	0.716	0.720	0.0040	0.0045	2.00
	1.0454	1.048	0.0006	0.0045	2.00
465.0	Zero	0.000	0.0000	0.0028	2.00
	0.5094	0.511	0.0016	0.0045	2.00
	0.6601	0.663	0.0029	0.0045	2.00
	0.963	0.965	0.0020	0.0045	2.00
546.1 (546.0)	Zero	0.000	0.0000	0.0028	2.00
	0.5206	0.523	0.0024	0.0045	2.00
	0.6677	0.672	0.0043	0.0045	2.00
	0.9763	0.979	0.0027	0.0045	2.00
590.0	Zero	0.000	0.0000	0.0028	2.00
	0.5522	0.553	0.0008	0.0045	2.00
	0.6966	0.698	0.0014	0.0045	2.00
	1.0201	1.020	-0.0001	0.0045	2.00
635.0	Zero	0.000	0.0000	0.0028	2.00
	0.5377	0.542	0.0043	0.0045	2.00
	0.6649	0.670	0.0051	0.0045	2.00
	0.9736	0.977	0.0034	0.0045	2.00

Remark : Each individual filter is measured against the empty filter holder (blank) used to zero the Spectrophotometer.

Note:

UUC* : Unit Under Calibration

- End of Report -

ISSUE 6 REV:5

FM-CAL-332

20/02/24

CAL

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NAC-THAI-781 12228
CALIBRATION 00295

Certificate of Calibration

Certificate No. : 68-400223-4

Submitted by :

Special Lab Envi and Consultant Co., Ltd.
47/91-93 Moo 3, Tambol Tha-It, Pakkret, Nonthaburi 11120

Equipment :

Temperature controlled enclosure (Refrigerator)

Manufacturer : Frozen

Range : N/A °C

Serial No. : CC-2288F-1163-003

Model : CC-2288F
Resolution : 1 °C

ID No. : LB-Eq-046

Environment :

On site calibration was carried out at the Laboratory, Special Lab Envi and Consultant Co., Ltd.

Ambient Temperature : (25.5 to 26.5) °C

Relative Humidity : (50 to 55) %

Line Voltage : (226.0 to 226.5) V

Date of Received : 19 April 2025

Date of Calibration : 19 April 2025

Date of Issue : 26 April 2025

Calibrated by : Permporn Chuapru

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

ID No.

400029 & 400032

Cert. No.

67-400584-1

Due Date

29 Apr 2025

Traceability

National Institute of Metrology Thailand (NIMT)

Page : 1 of 2

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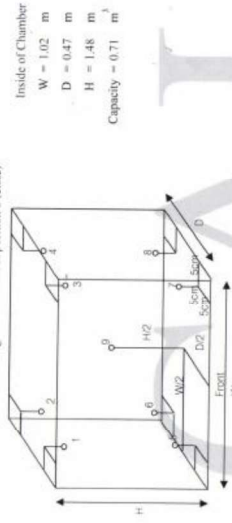
Certificate of Calibration

Certificate No. : 68-400223-4

UIC Condition As-Received : Good

Function : Temperature measurement

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



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	
3	3	3	4.0	3.0	2.8	2.6	4.0	4.0	2.2	2.0	3.0	1.0

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)		Measured Stability (°C)		Overall Variation (°C)
			3	1.3	0.5	0.5	
3	3	3					2.7

Remark: This instrument is used as a reference instrument for calibration.

Certificate of Calibration

Page : 1 of 2

Certificate No. : 68-400237-2

Submitted by : Special Lab Envi and Consultant Co., Ltd.

Equipment : 47/91-93 Moo 3, Tambol Thu-I, Pakkret, Nonthaburi 11120

Environment : Liquid in Glass Thermometer

Manufacturer : SK
Range : 0 °C to 100 °C
Model : N/A
Resolution : 1 °C
Serial No. : N/A
Immersion : Total
ID No. : LB-Eq-020

Ambient Temperature : (23 ± 2) °C

Relative Humidity : (50 ± 15) %

Line Voltage : (220 ± 22) VAC

Date of Received : 19 April 2025

Date of Calibration : 23 April 2025

Date of Issue : 23 April 2025

Calibrated by : Chorrrip Sanchusuri

Calibration Method : This instrument was calibrated by In-house method comparison technique CAL-M4001 based on ASTM E77-07 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

400001 TT-0023-24 16 Feb 2026

2. Standard Digital Thermometer

ID No. Cert. No. Due Date

Certificate of Calibration

Page : 2 of 2

Certificate No. : 68-400237-2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement

Ice point check : UUC* reading 0 °C Standard reading -0.0899 °C

Standard Reading (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (± °C)
24.9944	25	0.0	0.31

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%.

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Certificate of Calibration

Page : 1 of 2

Certificate No. : 68-200127-1

Submitted by : Special Lab Envi and Consultant Co., Ltd.
47/91-93 Moo 3, Tambol Tha-It, Pakkret, Nonthaburi 11120

Equipment : Electronic Balance
Manufacturer : AND Model : GR-200
Serial No. : 14245322 ID No. : LB-Eq-016
Capacity : ~ 210 g Resolution : 0.0001 g

Environment : On site calibration was carried out at the Laboratory.

Special Lab Envi and Consultant Co., Ltd.

Ambient Temperature : (25.5 to 26.1) °C
Relative Humidity : (56.6 to 57.0) %
Air Pressure : 1008.0 mbar

Date of Received : 19 April 2025
Date of Calibration : 19 April 2025
Date of Issue : 22 April 2025

Calibrated by : Satja Sangthum

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

Certificate of Calibration

Page : 2 of 2

Certificate No. : 68-200127-1

Result of Calibration : Without Adjustment
UUC Condition As-Received : Good

Departure of indication from nominal value

Nominal Value (g)	Correction (g)	Uncertainty ± (g)
0.001	0.0000	0.00011
0.01	0.0000	0.00011
0.1	0.0000	0.00011
0.5	0.0000	0.00011
2	0.0000	0.00011
5	0.0000	0.00011
10	0.0000	0.00011
50	0.0001	0.00014
100	0.0001	0.00020
200	0.0000	0.00038

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 $k = 2.00$, providing a level of confidence of approximately 95%.

Eccentric error Load test : 50 g

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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TEL. 0-2717-3000 FAX. 0-2719-9484

Certificate of Testing

Cert.No.: 25TW23
Page.: 1 of 2

Equipment : DO Meter
Manufacturer : Hanna
Model : H98193
Serial No. : 09120032101
ID No. : LB-Eq-014
Received Date : 04 February 2025
Test Date : 05 February 2025
Reference : 2502-0115WN-1
Submitted by : Special Lab Envr And Consultant Co.,Ltd
47/91-93 Moo 3 Thambon Tha-L,

Calibration Method: 44500



Cert.No.: 25TW23
Page.: 2 of 2

Condition of this result of calibration

- Reference Standard Instruments :
This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1. Burette	-	130BU10	23CG1172	22 Mar 2025
2. Balance	14233821	110RC001	24MM131	04 July 2025
2. Standard Material :-				
Material	Manufacturer	Lot.No.	Assay	
Sodium Thiosulfate 5-Hydrate AR	KEMAUS	2203162447	99.6%	

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: KCIN8943T

Titration Method DO Meter



Certificate of Calibration

Certificate No. : 68-400236-1

Page : 1 of 2

Submitted by : Special Lab Envi and Consultant Co., Ltd.

47/91-93 Moo 3, Tambol Tha-It, Pakkret, Nonthaburi 11120

Equipment : Digital Thermometer with Thermocouple probe Type K

Temperature Indicator

Manufacturer : Thermo Scientific

Model : TEMP 10K

Range : -250 °C to 1372 °C

Resolution : 0.1 °C

Serial No. : 4008958

ID No. : LB-Eq-013

Environment :

Ambient Temperature : (23 ± 2) °C

Relative Humidity : (50 ± 15) %

Line Voltage : (220 ± 22) VAC

Date of Received : 19 April 2025

Date of Calibration : 22 April to 24 April 2025

Date of Issue : 24 April 2025

Calibrated by : Chortip Samchusri

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. : 400001

Cert. No. : TT-0023-24

Due Date : 16 Feb 2026

Traceability : National Institute of Metrology Thailand (NIMT)

National Institute of Metrology Thailand (NIMT)

National Institute of Metrology Thailand (NIMT)

2. Standard Digital Thermometer

ID No. : 400003

Cert. No. : 23E/866

Due Date : 01 Jun 2025

Traceability : National Institute of Metrology Thailand (NIMT)

National Institute of Metrology Thailand (NIMT)

National Institute of Metrology Thailand (NIMT)

Certificate of Calibration

Certificate No. : 68-400236-1

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement with Thermocouple probe Type K

Model : Type K Sheath Material : Teflon
Diameter : 2 mm Length : 1500 mm
Serial No. : N/A ID No. : SL-39

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (± °C)
130	3.0028	3.5	-0.5	0.18
130	20.0022	20.5	-0.5	0.18
130	104.0020	104.2	-0.2	0.45
130	150.0022	150.3	-0.3	0.58
130	180.0023	178.8	1.2	0.65

Model : AD-1218-230 Sheath Material : Stainless

Diameter : 3.5 mm Length : 230 mm

Serial No. : N/A ID No. : SL-40

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (± °C)
124	380.0057	379.5	0.5	1.5
124	399.9903	399.3	0.7	1.6



Thermology Co., Ltd.

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96/177-96/178 Moo 6, T. La-karn, A. Bangbuastrong, Nonthaburi 11110
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CALIBRATION CERTIFICATE

Date of Issue Jun 17, 2025 Cert No. 252478
Order No. 25060343

Customer SPECIAL LAB ENVI AND CONSULTANT CO., LTD.
4791 Moo 3, The-It, Pakkret, Nonthaburi 11120

Place of Calibration Laboratory Room

Description Oven
Model UF30
Serial No. B123.0544
ID No. LB-Eq-047
Date of Receipt Jun 16, 2025
Date of Calibration Jun 16, 2025

Environment
Temperature (Min) 29.4 °C (Max) 30.8 °C
Relative Humidity (Min) 48.7 %rh (Max) 52.6 %rh

Calibration Method

Wt-17 : The reference thermometer was placed into the chamber and measurement was performed based on AS-2853.
The temperature scale in use at this laboratory is the International Temperature Scale of 1990.



Thermology Co., Ltd.

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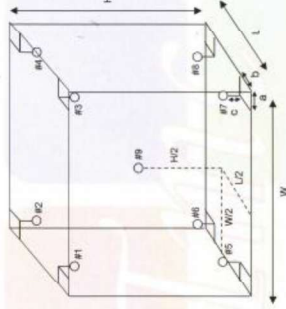


96/177-96/178 Moo 6, T. La-karn, A. Bangbuastrong, Nonthaburi 11110
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CALIBRATION CERTIFICATE

Date of Issue Jun 17, 2025 Cert No. 252478
Order No. 25060343

Results (without adjustment)



Note.

CALIBRATION CERTIFICATE

Date of Issue Jun 17, 2025 Cert No. 25/2478
 Order No. 25060343

Results (without adjustment)

Cal Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability $\pm$ (°C)	Uniformity (°C)	Uncertainty $\pm$ (°C)
104.0	104.0	104.0	Position 1	104.381	0.962	0.36
			Position 2	103.624		
			Position 3	103.718		
			Position 4	103.628		
			Position 5	103.579		
			Position 6	103.557		
			Position 7	103.569		
			Position 8	103.587		
			Position 9	103.513		

CALIBRATION CERTIFICATE

Date of Issue Jun 17, 2025 Cert No. 25/2478
 Order No. 25060343

Results (without adjustment)

Cal Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability $\pm$ (°C)	Uniformity (°C)	Uncertainty $\pm$ (°C)
180.0	180.0	180.0	Position 1	181.288	1.994	0.57
			Position 2	179.511		
			Position 3	179.762		
			Position 4	179.572		
			Position 5	179.506		
			Position 6	179.420		
			Position 7	179.327		
			Position 8	179.840		
			Position 9	179.353		



Hanna Instruments (Thailand) Ltd.
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Huaykwang, Bangkok 10310 Tel: 0-2541-4199 Fax: 0-2541-4198



AC-3061

Certificate No. : HIT-2522-0864

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CERTIFICATE OF CALIBRATION

Equipment : Advanced pH/ORP/Temperature Benchtop Meter
Meter Model : HI6221-02 **Serial No. :** 102180040111
Probe Model : HI1053B **Serial No. :** 1140205N
Resolution (pH) : 0.01 **Resolution (mV) :** 0.1
Manufacturer : Hanna Instruments **Made in :** Romania
Condition As-Received : New Product **Reference :** RE250928
Ambient Temperature : (25 ± 2) °C **Relative Humidity :** (50 ± 15) % RH
Customer name : SPECIAL LAB ENVI AND CONSULTANT CO., LTD.
4791-93 Moo.3 , T. Tha-ri, A. Pakkret,
Nonthaburi 11120

Received date : 21 May 2025
Calibrate date : 26 May 2025
Issue date : 26 May 2025



Certificate No. : HIT-2522-0864
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Condition of this calibration result

1. Reference Standard Instruments : This certification is traceable to the international unit of unit maintained through:

Instruments	Model	Serial No.	Certificate No.	Traceable
Documenting Process Calibrator	Fluke 753	43160061	25E399	Technology Promotion Association (Thailand-Japan)
Thermometer with sensor	HI98509	36943D	24T1281	
Digital Thermo-Hygrometer	HT-771SD	AL07155	25H171	

2. Reference Standard Materials : pH calibration standard traceable thru CPA chem Ltd.

Buffer Solution	Manufacturer	Certified Value	Lot Number	Exp. date
pH 4.0	CPA chem	4.007 ± 0.006@25°C	1086537	26 April 2026
pH 7.0	CPA chem	6.965 ± 0.007@25°C	1074440	8 February 2026
pH 10.0	CPA chem	10.011 ± 0.008@25°C	1086538	26 April 2026

Calibration Result :

1. Performing standard curve by Simulator at: -177.5, 0.0, 177.5 mV
(Measurement Electrical Potential) After Adjust Result.

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (± mV)
	pH	mV	pH	mV	



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES
53/44 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL:0-2717-3000-29 FAX:0-2719-9484



Certificate of Calibration

Cert.No.: 25CH644
Page.: 1 of 3

Equipment : pH Meter
Manufacturer : Horiba
Model : LAQUAAad-PH130
Serial No. : D08C0004
ID No. : -
Condition As-Received : Used Item
Received Date : 02 June 2025
Calibration Date : 05 June 2025
Reference : 2506-0035WN-1
Submitted by : Special Lab Envi And Consultant Co.,Ltd
47/91-93 Moo 3 Tambon Tha-It, Pakkret
Nonthaburi 11120

Ambient Temperature : (25 ± 2.5) °C
Relative Humidity : (50 ± 15) %
Calibration Procedure : In - house method :
- CP-CH5 by direct measurement with DC voltage
standard and direct measurement with
certified reference material (CRM)
CP-CH8 by comparison with temperature - checked



Cert.No.: 25CH644
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument
- | Instrument | Serial No. | ID No. | Cert. No. | Due Date |
|--------------------------------|------------|----------|-----------|-------------|
| 1) Document Process Calibrator | 43100068 | 130RC092 | 25E1217 | 17 Apr 2026 |
| 2) Ref. Standard Thermometer | 2186080 | 130RC044 | 2411022 | 16 Sep 2025 |
- This measurement result is traceable to SI through Technology Promotion Association (Thailand - Japan)
2. Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd.,
ANSI/ASQ National Accreditation Board, Accredited No. AR-1635

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.027	CPA chem	1066665	18 Jan 2027
pH 6.895	CPA chem	940103	02 Nov 2025
pH 9.180	CPA chem	1066668	18 Jan 2026

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration Results

Function : mV Measurement

Performing standard curve by Document Process Calibrator at pH (4,7,9)

Unit Under Calibration	Nominal Value	Standard Voltage Input		Actual Reading		Uncertainty of Measurement (mV)	Coverage factor k
		mV	pH	mV	pH		
pH Meter S/N: D08C0004	4.00	177.48	4.00	177	4.00	0.58	2.00
	6.86	8.28	8	6.86	8	0.58	2.00
	9.18	-128.97	9.18	-129	9.18	0.58	2.00



Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,9)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement ($\pm$)	Coverage factor k
pH Electrode	4.007	4.02	146	0.0088	2.05
S/N: 988ED098	8.885	8.87	-16	0.043	2.65
	9.180	9.20	-135	0.045	2.65

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe:

- Model : 9051

- Serial No. : 988ED098

Dimension of probe

- Length : 100 mm.

- Diameter : 16 mm.

- Immersion Depth : 90 mm.

Calibration Point ($^{\circ}\text{C}$)	Standard Temperature ($^{\circ}\text{C}$)	UUC* Reading ($^{\circ}\text{C}$)	Error ($^{\circ}\text{C}$)	Uncertainty of measurement ($\pm$ $^{\circ}\text{C}$)	Coverage factor k
25.0	25.005	25.0	-0.005	0.13	2.00
30.0	30.004	30.0	-0.004	0.13	2.00
40.0	40.004	40.0	-0.004	0.13	2.00

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k , providing a level of confidence of approximately 95 %.

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