



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-27 FAX. 0-2719-9484



NIST 101-11617025
CALIBRATION 0006

Cert.No.: 21CH188
Page.: 1 of 3

Certificate of Calibration

Equipment : pH Meter
Manufacturer : TOA DKK
Model : HM-25R
Serial No. : 760205
ID No. : EQL-183
Condition As-Received: Used Item
Received Date : 11 February 2021
Calibration Date : 12 February 2021
Reference : 2102-0517DN-2

Submitted by : TEST TECH CO.,LTD (HEAD Office)
30,32 Rama II Soi 63, Rama II Rd., Samaedam,
Bangkhunthian, Bangkok 10150
(25 ± 2.5) °C
(50 ± 15) %
In - house method :
- CP-CH8 by direct measurement with standard
voltage calibrator and direct measurement with
certified reference material (CRM)
- CP-CH8 by comparison with standard thermometer

Calibrated by : Uthen Kankawi

Approved by :

(✓) Malee Butkruea
() Saithip Meangmai
() Warakorn Lengagtrakul

Issue Date : 17 February 2021

Approved Signatory

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

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Cert.No.: 21CH188
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument : -
Instrument : Standard Thermometer
Serial No. : 2188080 ID No. : 130RC044 Cert. No. : 2011389 Due Date : 19 Nov 2021
This certification is traceable to the International System of Unit maintained at:-
- Traceable to National Institute of Metrology (Thailand), NIMT
2. Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	706694	06 Sep 2022
pH 6.985	CPA chem	706696	06 Sep 2021
pH 10.008	CPA chem	706695	06 Sep 2021

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

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH measurement (±)	Coverage factor k
pH Electrode S/N.: 002F0035MK	4.008	4.01	174	0.0079	2.00
	6.985	7.00	0	0.0099	2.00
	10.008	10.01	-176	0.013	2.00

Remark - Can not connect the BNC because the plug does not match with the socket.

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Cert.No.: 21CH188
Page.: 3 of 3

Calibration Results

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : GST-5731C

- Serial No. : 002F0035MK

Dimension of probe;

- Length : 120 mm.

- Diameter : 12 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
25.0	25.006	24.8	-0.206	0.20	2.00

Remark : - UUC* = Unit Under Calibration

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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NSC-TSI-TIS17025
CALIBRATION 0008

Cert.No.: 20CH1554
Page.: 1 of 3

Certificate of Calibration

Equipment : pH Meter
Manufacturer : TOA-DKK
Model : HM-41X
Serial No. : 784787
ID No. : EOL-199
Condition As-Received:
Used Item
Received Date : 12 October 2020
Calibration Date : 16 October 2020
Reference : 2010-0434DN-5

Submitted by : TEST TECH CO.,LTD (HEAD Office)

30.32 Rama II Soi 63, Rama II Rd.,
Samaedam, Bangkokthian, Bangkok 10150

Ambient Temperature : (25 ± 2.5) °C

Relative Humidity : (50 ± 15) %

Calibration Procedure :

In - house method :
- GP-CH5 : based on direct measurement by using standard voltage calibrator and certified reference material (CRM)
- GP-CH8 : based on comparison technique by comparison with reference standard thermometer

Calibrated by : Warakorn Lengagtrakul

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Approved by :

Approved Signatory

() Pornthippa Tameyakul

() Malee Butkruea

() Sathip Meangmai

Issue Date :

20 October 2020

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

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Cert.No.: 20CH1554
Page.: 2 of 3

Condition of this calibration result

- Reference Standard Instrument :

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Ref. Standard Thermometer	2188080	130RC044	191510	27 Nov 2020

This certification is traceable to the International System of Unit maintained at:-
- Traceable to National Institute of Metrology (Thailand), NIMT
- Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	693945	21 June 2022
pH 6.985	CPA chem	706696	06 Sep 2021
pH 10.008	CPA chem	699315	16 July 2021

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

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH measurement (±)	Coverage factor k
pH Electrode S/N.: 603F0107YK	4.008	4.011	173	0.0046	2.00
	6.985	6.993	-1	0.0075	2.00
	10.008	10.018	-180	0.013	2.05

Remark - Can not connect the BNC because the plug does not match with the socket.

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Cert.No.: 20CH1554
Page.: 3 of 3

Calibration Results

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : GST-5821C

- Serial No. : 603F0107YK

Dimension of probe;

- Length : 120 mm.

- Diameter : 12 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
25.0	25.003	24.9	-0.103	0.20	2.00

Remark : - UUC* = Unit Under Calibration

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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Certificate of Calibration

Certificate No. : 21M293
Page : 1 of 2

Equipment : Standard Weight
Manufacturer: LS
Model :
Serial No. :
ID No. : EQL-121
Condition As-Received: Used Item
Received Date: 15 February 2021
Calibration Date: 22 February 2021

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Corporate Services 3: Equipment Calibration and Testing Services.

Submitted by: TEST TECH CO.,LTD (HEAD Office)

30,32 Rama II Soi 63, Rama II Rd., Samaedam,
Bangkhunthian, Bangkok 10150

Reference: 2102-0613DN
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %
Atmospheric Pressure: 1010 mbar

Procedure used: Calibration were conducted using in-house calibration procedure CP-M01 according to comparison method against standard weights on the basis of weighings at an average air density of 12 kg/m³ and a temperature of 23.0 °C material density of weight is 8000 kg/m³.

Condition of this result of calibration

1. Reference standards instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Standard weight Set (E2)	YCS31-712-00	50202965	MM-0102-20	13 Jul 2022

2. This certificate is not certified for any commercial transaction.

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

4. This Certificate is traceable to the International System of Unit maintained at:-

-National Institute of Metrology Thailand (NIMT)

Calibrated by : Sattawat Paowmanee
Issue Date : 23 February 2021

Approved Signatory :
[] Phalinee Prabpaipal
[x] Sura Suwamasri
[] Chaowalit Ritirak

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Cert No.: 21M293
Page: 2 of 2

Result of calibration Without adjustment

Nominal Value	Conventional mass	Uncertainty of Measurement (±)	Maximum Permissible error (±)
50 g	50.00010 g	0.10 mg	0.30 mg

The 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

Certificate No. : 21M1550
Page : 1 of 2

Equipment : Standard Weight
Manufacturer :
Model :
Serial No. : M 0030/11
ID No. : EQL-139
Condition As-Received: Used Item
Received Date: 25 August 2021
Calibration Date: 01 September 2021
Reference: 2108-0772WN
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %
Atmospheric Pressure: 1006 mbar

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Corporate Services 3: Equipment Calibration and Testing Services.

Submitted by: TEST TECH CO.,LTD (HEAD Office)
30,32 Rama II Soi 63, Rama II Rd., Samaedam,
Bangkhunthian, Bangkok 10150
Procedure used: Calibration were conducted using in-house calibration procedure CP-M01 according to comparison method
against standard weights on the basis of weighings at an average air density of 1.2 kg/m³ and a temperature
of 23.0 °C material density of weight is 8000 kg/m³.

Condition of this result of calibration

1.Reference standards instruments :

Instrument

Model YCS31-712-00

Serial No. 50202985

Certificate No. MM-0102-20

Due Date 13 Jul 2022

1) Standard weight Set (E2)

2.This certificate is not certified for any commercial transaction.

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

4.This Certification is traceable to the International System of Unit maintained at-

-National Institute of Metrology Thailand (NIMT)

Calibrated by : Chaowalit Ritirak
Issue Date : 02 September 2021

Approved Signatory :
[] Phalinee Prabpaipal
[] Sura Suwanasri
[] Chaowalit Ritirak



Cert No.: 21M1550
Page: 2 of 2

Result of calibration Without adjustment

Nominal Value	Conventional mass	Uncertainty of Measurement (±)	Maximum Permissible error (±)
2 g	2.000024 g	0.040 mg	0.12 mg

The 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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MSZ-TS-7517:2025
CALIBRATION 0008

Certificate of Calibration

Certificate No. : 21M1549
Page : 1 of 2

Equipment : Standard Weight
Manufacturer: Mettler Toledo
Model :
Serial No.: 11119459
ID No.: EQL-149
Condition As-Received: Used Item
Received Date: 25 August 2021
Calibration Date: 01 September 2021

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Corporate Services 3: Equipment Calibration and Testing Services.

Submitted by: TEST TECH CO.,LTD (HEAD Office)

Reference: 2108-0772WN
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %
Atmospheric Pressure: 1006 mbar

Procedure used: Calibration were conducted using in-house calibration procedure CP-M01 according to comparison method against standard weights on the basis of weighings at an average air density of 1.2 kg/m³ and a temperature of 23.0 °C material density of weight is 8000 kg/m³.

Condition of this result of calibration

1.Reference standards instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Standard weight Set (E2)	YCS31-712-00	50202965	MM-0102-20	13 Jul 2022

2.This certificate is not certified for any commercial transaction.

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

4.This Certification is traceable to the International System of Unit maintained at-

-National Institute of Metrology Thailand (NIMT)

Calibrated by : Chaowalit Rittrak
Issue Date : 02 September 2021

Approved Signatory :
[] Phalinee Prabpai
[] Sura Suwamasri
[] Chaowalit Rittrak

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Cert No.: 21M1549
Page: 2 of 2

Result of calibration Without adjustment

Nominal Value	Conventional mass	Uncertainty of Measurement (±)	Maximum Permissible error (±)
20 g	20.000018 g	0.080 mg	0.25 mg

The 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

Certificate No.: 21T805
Page: 1 of 2

Equipment: Digital Thermometer With Sensor
Manufacturer: Testo
Model: 926
Serial No.: 5609260110250914
ID No.: EQL-058
Condition As-Received: Used Item
Received Date: 26 April 2021
Calibration Date: 28 April 2021 to 11 May 2021
Reference: 2104-0645WN
Ambient Temperature: (25 ± 3) °C
Relative Humidity: (50 ± 20) %

Submitted by: TEST TECH CO.,LTD (HEAD Office)

30,32 Rama II Soi 63, Rama II Rd., Samaedam,
Bangkhunthian, Bangkok 10150

Procedure used: Calibration were conducted using in-house calibration procedure CP-T01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) into liquid bath temperature controller.
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standards Instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Black Stack Thermometer	1560	8C454	201581	20 May 2021
2) PRT Scanner Module	2562	A01303	201581	20 May 2021
3) Industrial PRT Probe	5627A	979442	201581	20 May 2021
4) Digital Thermometer	1529	A66176	201303	07 Nov 2021
5) Industrial Platinum Resistance Thermometer	5627	739435	201303	07 Nov 2021

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

3. This Certification is traceable to the International System of Unit maintained at:-

-National Institute of Metrology Thailand (NIMT)

Calibrated by : Plak Srimongkol
Issue Date : 13 May 2021

Approved Signatory :

[] Phalinee Prabpaipal
[x] Chatchawan Khunpluek
[] Wanlop Larpkum



Cert. No.: 21T805
Page.: 2 of 2

Result of Calibration:-
Function: Temperature measurement
Without Adjustment
This equipment was connected with Thermocouple Type T

Immersion Depth (mm.)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of Measurement (±°C)
150	3.9975	3.9	-0.0975	0.24
150	20.0005	19.9	-0.1005	0.24
150	34.9956	34.9	-0.0956	0.24
150	35.9978	36.0	0.0022	0.26
150	55.0023	54.7	-0.3023	0.25
150	100.0048	99.6	-0.4048	0.35
150	103.9978	103.8	-0.1978	0.36
150	119.9973	119.7	-0.2973	0.42
150	139.9975	139.7	-0.2975	0.47
150	150.0029	149.7	-0.3029	0.49
150	170.0037	169.6	-0.4037	0.55
150	179.9975	179.4	-0.5975	0.58

Result of Calibration:-

Function: Temperature measurement
Without Adjustment

This equipment was connected with Thermocouple Type T
Dimension of probe : Diameter 5 mm., Length 112 mm. Sheath material : Stainless Steel

Immersion Depth (mm.)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of Measurement (±°C)
90	40.9967	40.9	-0.0967	0.24
90	44.9988	44.9	-0.0988	0.24
90	50.0006	49.9	-0.1006	0.24
90	83.0026	82.8	-0.2026	0.31
90	91.9953	91.7	-0.2953	0.33
90	95.0009	94.7	-0.3009	0.34
90	149.9951	149.5	-0.4951	0.49

UUC* : Unit Under Calibration

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

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NIST T-1618725
CALIBRATION 0008

Certificate of Calibration

Certificate No.: 20H2567
Page: 1 of 2

Equipment: Dial Thermo-Hygrometer
Manufacturer: Barigo
Model: -
Serial No.: -
ID No.: EQL-064
Condition As-Received: Used Item
Received Date: 03 November 2020
Calibration Date: 05 November 2020
Reference: 2011-0073DN
Ambient Temperature: (25 ± 3) °C
Relative Humidity: (50 ± 20) %

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Submitted by: TEST TECH CO.,LTD (HEAD Office)

30,32 Rama II Soi 63, Rama II Rd., Samaedam,
Bangkhunthian, Bangkok 10150

Procedure used: Calibration were conducted using in-house calibration procedure CP-H02 according to comparison with standard chilled mirror sensor for humidity measurement function and comparison with standard temperature probe for temperature measurement function into humidity / temperature chamber.

Condition of this result of calibration

1. Reference standards instruments:

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Standard Chilled Mirror Hygrometer Sensor	Dew Prime II	31863	18540	28 Jul 2021
2) Standard Humidity/Temperature Meter	400	10240757	TH-0056-19	11 Dec 2020

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

3. This Certification is traceable to the International System of Unit maintained at:-

-National Institute of Standards and Technology (NIST), The United States of America
-National Institute of Metrology Thailand (NIMT)

Calibrated by: Kraipon Onrat
Issue Date: 10 November 2020

Approved Signatory:

[✓] Chakrit Waewanjua
[] Ponthipha Tameyakul
[] Pitak Srimongkol



Cert. No.: 20H2567
Page.: 2 of 2

Result of Calibration:- Function:			
Humidity measurement.			
Reference Temperature (°C)	Standard Humidity (%R.H.)	UUC* Reading (%R.H.)	Uncertainty of Measurement (±%R.H.)
25.0	30.1	28.5	1.5
25.0	40.1	39.0	1.5
25.0	50.1	50.5	1.7
25.0	60.0	61.0	1.7
25.0	75.2	77.0	1.7

Result of Calibration:- Function:			
Temperature measurement.			
Reference Temperature (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Uncertainty of Measurement (±°C)
15.02	15.02	15.0	0.72
20.03	20.03	20.0	0.72
25.00	25.00	25.0	0.72
29.97	29.97	30.0	0.72

UUC*: Unit Under Calibration

The reported uncertainty of measurement was base on standard uncertainty multiplied by coverage factor k = 2.00, providing confidence level approximately 95%.

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