
เอกสารสอบเทียบเครื่องมือที่ใช้ในการวิเคราะห์



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
53/44 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-5000-29 FAX. 0-2719-9484



NIST-TPA
CALIBRATION 0008

Cert.No.: 23CH276
Page.: 1 of 2

Certificate of Calibration

Equipment : pH Meter
Manufacturer : Eutech
Model : pH 510
Serial No. : 293152
ID No. : pHM-03
Condition As-Received:
Received Date : 10 February 2023
Calibration Date : 27 February 2023
Reference : 2302-0368DC-1
Submitted by : Environment & Laboratory Co.,Ltd.
40 Soi Liangmueangnonthaburi 13 Talad Kwan,
Mueang, Nonthaburi 11000
(25 ± 2.5) °C
(50 ± 15) %
Ambient Temperature :
Relative Humidity :
Calibration Procedure : In - house method :
- CP-CH5 by direct measurement with standard
voltage calibrator and direct measurement
with certified reference material (CRM)

Calibrated by :

Approved by :

() Malee Buikruea
() Sathip Meangmai
() Warakorn Lemgagrakul

Issue Date :

7 March 2023

Approved Signatory

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

A 0051726



Cert. No.: 23CH276
Page.: 2 of 2

Condition of this calibration result

- Reference Standard Instrument : -

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	22E2769	24 Aug 2023

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	826588	09 July 2024
pH 6.987	CPA chem	826589	09 July 2023
pH 10.010	CPA chem	863835	28 Dec 2023
- This certificate is valid only to the item calibrated on date and place of calibration.

Calibration Results

Function : mV Measurement

Performing standard curve by Fluke at pH (4.7,10)

Unit Under Calibration	Nominal Value		Standard Voltage Input mV	Actual Reading		Uncertainty of Measurement (±mV)	Coverage factor k
	pH			mV	pH		
pH Meter S/N.: 293152	4.00		177.48	177.4	4.01	0.058	2.00
	7.00		0.00	0.0	7.00	0.058	2.00
	10.00		-177.48	-177.3	10.01	0.058	2.00

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		Uncertainty of pH measurement (±)	Coverage factor k
		mV	pH		
pH Electrode S/N.: ECF7252101B 262	4.008	4.01	176.5	0.0085	2.05
	6.987	7.00	1.7	0.011	2.00
	10.010	10.01	-173.6	0.0092	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 %.

-o0o-

a 1150714



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
5344 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484



NIST-JTIR
CALIBRATION 0008

Cert. No.: 23TM1173
Page : 1 of 3

Certificate of Calibration

Equipment : Water Bath
Manufacturer : Memmert
Model : WB 22
Serial No. : I505.0053
ID No. : WAB-01
Submitted by : Environment & Laboratory Co.,Ltd.
40 Soi Liangmueangnonthaburi 13,
Talad Kwan, Mueang,
Nonthaburi 11000
Room No. 303
Location :

Received Order : 12 July 2023
Calibration Date : 12 - 13 July 2023
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by : 
Approved by : 
Approved Signatory

() Pornthippa Tameyakul
(/) Malee Butkruea
() Suwit Injai

Issue Date : 24 July 2023

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

A 0056487



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2307-0094OC-3
Procedure Used :-
Cert. No.: 23TM1173
Page : 2 of 3

Calibration were conducted using in-house calibration procedure CP-OT04 according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Thermometer (IPRT).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY44073381	23LM95	TPA	19 May 2024

2. This 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.

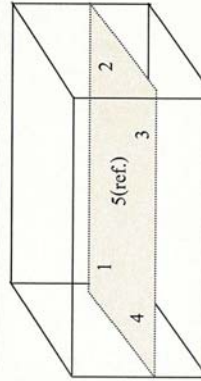
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Heat transfer medium used : Water

	Environmental		AC Voltage Supply
	(°C)	(%R.H.)	(Volt)
Beginning of Calibration	30	47	220
Finished of Calibration	31	50	221



Front

Position :	Ref. Std. S/N.:
1	4803988-006
2	4803988-007
3	4804539-014
4	4804539-015
5(ref.)	4804539-016

a 1172193



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2307-0094OC-3
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Cert. No.: 23TM1173
Page : 3 of 3

Calibration point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Average* Standard Reading (°C)					Uncertainty (± °C)
			Position					
			1	2	3	4	5 (ref.)	
44.5	44.5	44.5	44.507	44.503	44.498	44.509	44.502	0.15
60.0	60.0	60.0	59.914	59.928	59.912	59.899	59.894	0.15

Calibration point (°C)	Uniformity (°C)	Stability (± °C)	Coverage Factor k
44.5	0.039	0.023	2
60.0	0.098	0.042	2

Average* : The average of 30 values in each position.

Uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Stability : One-half of the greatest maximum difference of measured temperature at any one probe.

UUC* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity.

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 %.

-oOo-



a 1172192



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
5344 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert. No.: 23TM1099
Page : 1 of 3

Certificate of Calibration

Equipment : Autoclave
Manufacturer : Rexall
Model : LS-2D
Serial No. : 04131
ID No. : AUT-01

Submitted by : Environment & Laboratory Co., Ltd.
40 Soi Liangmueangnonthaburi 13,
Talad Kwan, Mueang,
Nonthaburi 11000
Location : Room No. 205

Received Order : 12 July 2023
Calibration Date : 12 July 2023
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by :

Approved by :

() Pornthippa Tameyakul
(✓) Malee Bulkruea
() Suwit Imjai

Approved Signatory

Issue Date : 24 July 2023

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

A 0056477



Equipment : Autoclave
Condition As-Received : Used Item
Reference : 2307-0094OC-7
Cert. No.: 23TM1099
Page : 2 of 3

Procedure Used :-

Calibration were conducted using in-house calibration procedure CP-OT03 according to direct measurement method with Data Acquisition which connected with Thermocouple Type T
The temperature scale used was based on ITS-90.

Condition of this result of calibration

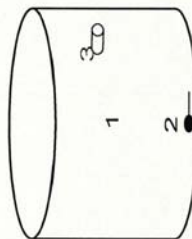
1. Reference standard instrument:-
- | Instrument | Serial No. | Cert. No. | Traceable | Due Date |
|---------------------|------------|-----------|-----------|-------------|
| 1) Data Acquisition | MY41021843 | 22LM172 | TPA | 27 Dec 2023 |
2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.
4. This result of calibration covers laboratory autoclaves for the sterilization of goods and material which could be infected with organisms categorized as Hazard Group 1, 2 and 3**

(** = Categorization of pathogens according to hazard and categories in Hazard Group 4, for which it does not cover autoclaves for use with material infect with organisms in Hazard Group 4, for which complete containment and sterilization of infected condensate is considered to be essential.
This result of calibration does not apply to sterilizers or disinfectors used for medical, dental, pharmaceutical or veterinary purposes which are directly concerned with patient care, or those used for fabrics subjected to sterilization which are required to be dry at the end of cycle.

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source



Environmental	
	(°C)
Beginning of Calibration	30
Finished of Calibration	30

Position	Description	Ref. Std. ID No.:
1 =	Center of chamber	21-04TC-01
2 =	Temperature sensor	21-04TC-02
3 =	Exhaust port	21-04TC-03



Equipment : Autoclave
Condition As-Received : Used Item
Reference : 2307-0094OC-7
Cert. No.: 23TM1099
Page : 3 of 3

Result of Calibration :-

(*) Without Adjustment

Function of UUC* : Temperature Source

Operating parameter Set : Temperature = 121 °C

Sterilization period = 15 minute

UUC* Setting (°C)	UUC* Reading (°C)	Position	Average* Standard Reading (°C)	Stability (± °C)	Pressure Reading (kg/cm ²)	Uncertainty (± °C)	Coverage Factor k
121	-	1	121.837	0.89	1.2	1.3	2
		2	121.869				
		3	121.875				

Average* : The average of 30 values in each position.

Stability : One-half of the greatest maximum difference of measured temperature at any one probe.

UUC* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity .

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 %.

-o0o-



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert.No.: 23MM176
Page: 1 of 3

Certificate of Calibration

Equipment : Electronic Balance
Manufacturer : Mettler Toledo
Model : ML204T /00
Serial No. : B647342339
ID No. : ANB-003
Submitted by : Environment & Laboratory Co.,Ltd.
40 Soi Liangmueangnonthaburi 13,
Taled Kwan, Mueang,
Nonthaburi 11000
Location : Room No. 304
Received order : 12 July 2023
Calibration Date : 13 July 2023
Ambient Temperature : 15 °C to 40 °C
Relative Humidity : 30 % to 90 %
Calibrated by : [Redacted]
Approved by : [Redacted]
() Pornthippa Tameyakul
(✓) Malee Butkruea
() Suwit Imjai
Issue Date : 24 July 2023
Approved Signatory

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

A 0056485



Equipment : Electronic Balance
Condition As-Received : Used Item
Reference : 2307-0094OC-8

Cert.No.: 23MM176
Page: 2 of 3

Procedure used :-

Calibration were conducted using in-house calibration procedure CP-OB01 according to direct measurement method against standard weight.

Condition of this result of calibration

1. Reference standard instruments:-
- 1) Standard Weight Set (E2) 15884
2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This result of calibration was made on requested at the point specified by customer.
4. This certificate is not certified for any commercial transaction.
5. This certification is traceable to the International System of Unit.

Result of calibration () Without Adjustment (*) After Adjustment by Internal Calibration

Range capacity : 0 g to 220 g **Resolution** 0.0001 g

Before Adjustment :

Applied Weight (g)	Balance Reading (g)	Correction (g)	Measurement Uncertainty (± mg)	Coverage Factor (k)
100	99.9999	+0.0001	0.17	2.00
200	199.9998	+0.0002	0.29	2.00

After Adjustment :

1. Determination of the standard deviation of weighing machine (n = 10)

Applied Weight (g)	Standard Deviation of Reading (g)
100	0.00005
200	0.00007

a 1172197



Equipment : Electronic Balance
Condition As-Received : Used Item
Reference : 2307-0094OC-8

Result of calibration

2. Effect of off center loading

A mass of 100 g was placed to various position on the pan.
The weighing machine reading error obtained is given in the table

Position 1 (g)	Position 2 (g)	Position 3 (g)	Position 4 (g)	Position 5 (g)
-0.0003	-0.0001	-0.0004	-0.0004	-0.0003

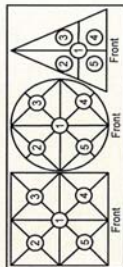
3. Departure from nominal value

Applied Weight (g)	Balance		Correction (g)	Measurement Uncertainty (± mg)	Coverage Factor (k)
	Reading (g)				
Unload	0.0000		0.0000	0.11	2.05
0.2	0.2000		0.0000	0.11	2.05
0.5	0.5000		0.0000	0.11	2.05
2	2.0001		-0.0001	0.11	2.05
5	5.0000		0.0000	0.12	2.05
10	9.9999		+0.0001	0.12	2.05
20	20.0001		-0.0001	0.12	2.04
50	50.0001		-0.0001	0.14	2.00
100	100.0000		0.0000	0.17	2.00
150	149.9999		+0.0001	0.29	2.00
200	200.0000		0.0000	0.29	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 %.

-o-o-

Cert.No.: 23MM176
Page: 3 of 3



Maximum difference between
off-center and central loading
(g)
0.0002



a 1172196



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484



NSC-TS18-TS17025
CALIBRATION 0008

Cert. No.: 23TM1171
Page : 1 of 3

Certificate of Calibration

Equipment : Hot Air Oven
Manufacturer : FRANCE ETUVES
Model : XU058
Serial No. : P427
ID No. : CHO-003
Submitted by : Environment & Laboratory Co., Ltd.
40 Soi Liangmueangnonthaburi 13,
Talat Kwan, Mueang,
Nonthaburi 11000
Location : Room No. 303
Received Order : 12 July 2023
Calibration Date : 12 July 2023
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by :

Approved by :

() Pornthippa Tameyakul
() Malee Butkruea
() Suwit Imjai

Approved Signatory

Issue Date :

24 July 2023

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

A 0056482



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2307-0094OC-1
Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument **Serial No.** **Cert. No.** **Traceable** **Due Date**
1) Data Acquisition MY44073381 23LM95 TPA 19 Jun 2024

2. This 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.

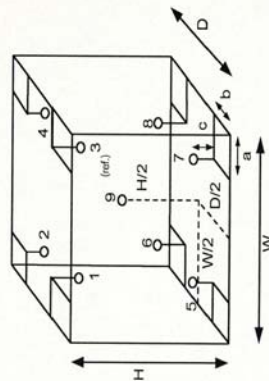
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :-

(*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close



Probe Installation Details :

a =	5.0	cm	D =	0.36	m
b =	5.0	cm	W =	0.40	m
c =	5.0	cm	H =	0.40	m
				Capacity =	0.058 m ³

Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2307-0094OC-1
Result of Calibration :-
(*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
104.0	104.0	104.0	0.11	0.78	1.1	2
180.0	180.0	180.0	0.16	1.2	1.4	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	1	2	3	4	5	6	7	8	9 (ref.)	
104.0	104.477	104.168	104.138	103.871	103.794	103.878	103.580	104.030	104.311	0.42
180.0	180.089	180.200	179.313	179.510	179.867	180.455	179.576	180.135	180.394	1.1

Average* : The average of 30 values in each position.

Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.

UUC* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity .

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 %.

-o0o-



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
5344 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert. No.: 23TM1273
Page : 1 of 3

Certificate of Calibration

Equipment : Incubator
Manufacturer : EnviLab-Intelligent
Model : -
Serial No. : -
ID No. : CHI-005
Submitted by : Environment & Laboratory Co.,Ltd.
40 Soi Liangmueangnonthaburi 13,
Talad Kwan, Mueang,
Nonthaburi 11000
Location : Room No. 204
Received Order : 24 August 2023
Calibration Date : 24 August 2023
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
Calibrated by : [Redacted]
Approved by : [Redacted] Approved Signatory
() Pornthippa Tameyakul
() Ponpan Paipim
(✓) Suwit Imjai
Issue Date : 29 August 2023

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

A 0057741



Equipment : Incubator
Condition As-Received : Used Item
Reference : 2308-0600OC-1
Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY44035217	22LM170	TPA	16 Dec 2023
2. This 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.

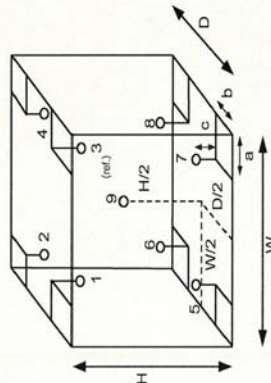
Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Not Available

Environment during calibration		
	Beginning	Finished
Temp. (°C)	23	23
REL.Humid. (%)	50	54
AC Supply (Volt)	220	220



Probe Installation Details :

	a =	5.0	cm
	b =	5.0	cm
	c =	5.0	cm
Dimension of Chamber :			
	D =	0.40	m
	W =	0.70	m
	H =	1.0	m
	Capacity =	0.28	m³

Position :	Ref. Std. ID No.:
1	18-10RTD-01
2	18-10RTD-02
3	18-10RTD-03
4	18-10RTD-04
5	18-10RTD-05
6	18-10RTD-06
7	18-10RTD-07
8	18-10RTD-08
9 (ref.)	18-10RTD-09

a 1176747



Equipment : Incubator
Condition As-Received : Used Item
Reference : 2308-06000C-1
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Not Available

Cert. No.: 23TM1273
Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
35.0	35.0	35.0	0.47	1.2	1.8	2

Calibration Point (°C)	Measured Temperature (°C)								Uncertainty (±°C)
	1	2	3	4	5	6	7	8	9 (ref.)
35.0	34.805	34.737	34.701	34.435	34.724	34.783	35.228	35.604	34.816
									0.71

Average* : The average of 30 values in each position.
Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.
Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.
UUC* : Unit Under Calibration
Note : The reported uncertainty of measurement was included stability and excluded uniformity .

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 %.

-o0o-



a 1176746



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert. No.: 23TM1101
Page : 1 of 3

Certificate of Calibration

Equipment : Incubator
Manufacturer : Songserm Intercool
Model : -
Serial No. : -
ID No. : CHI-001
Submitted by : Environment & Laboratory Co., Ltd.
40 Soi Liangmueangnonthaburi 13,
Talaiad Kwan, Mueang,
Nonthaburi 11000
Room No. 301
Received Order : 12 July 2023
Calibration Date : 13 July 2023
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
Calibrated by :
Approved by :
() Pornthippa Tameyakul
(/) Malee Bukruea
() Suwit Imjai
Issue Date : 24 July 2023



Approved Signatory

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

A 0056479



Equipment : Incubator
Condition As-Received : Used Item

Result of Calibration :-
Function of UUC* : Temperature Source
Fresh air setting : Not Available
 (*) Without Adjustment

<u>Traceable</u>	<u>Due Date</u>
TPA	27 Dec 2023

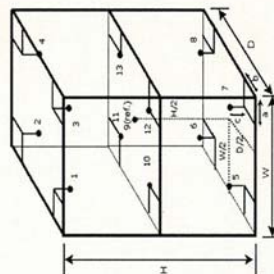
- Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :-

Function of UUC* : Temperature Source

sh air setting : Not Available

Position :	Ref. Std. ID No.:
1	18-04RTD-01
2	18-04RTD-02
3	18-04RTD-03
4	18-04RTD-04
5	18-04RTD-05
6	18-04RTD-06
7	18-04RTD-07
8	18-04RTD-08
9 (ref.)	18-04RTD-09
10	18-04RTD-10
11	21-04RTD-11
12	21-04RTD-12
13	21-04RTD-13



Probe Installation Details :

$a =$	10	cm
$b =$	10	cm
$c =$	10	cm

Average* : The average of 30 values in each position.

Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

UUC* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity.

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 %.

-000-