

List Certificate of Laboratory Instrument

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*	Remark
Laboratory Instrument for Water Quality Analysis									
1	Incubator	Total Coliform Bacteria	Binder	BD 53 /	Technology Promotion Association	23TM192	16 Feb 23	15 Feb 24	-
		E. Coli		13-07343	(Thailand-Japan)				
2	Incubator	Clostridium Perfringens	Binder	KB400 /	Technology Promotion Association	23TM726	27 Apr 23	25 Apr 24	-
		Legionella spp.		20200000015535	(Thailand-Japan)				
3	Incubator	Staphylococcus Aureus	Memmert	IF 75 /	Technology Promotion Association	23TM727	27 Apr 23	25 Apr 24	-
		Pseudomonas Aeruginosa		D317.0305	(Thailand-Japan)				
4	Incubator		Memmert	IN 75 /	Technology Promotion Association	23TM765	27 Apr 23	25 Apr 24	-
				D317.0307	(Thailand-Japan)				
5	Incubator		Memmert	IPP 260 /	Technology Promotion Association	23TM378	12 Apr 23	10 Apr 24	-
				V615.0187	(Thailand-Japan)				
6	Water Bath		Memmert	WNE 14 /	Technology Promotion Association	23TM374	11 Apr 23	9 Apr 24	-
				L414.1407	(Thailand-Japan)				
7	Water Bath		Memmert	WNE 14 /	Technology Promotion Association	23TM377	12 Apr 23	10 Apr 24	-
				L414.1410	(Thailand-Japan)				
8	Analytical Balance		OHAUS	PX623 /	DKSH (Thailand) Ltd.	C01223732	9 Dec 22	8 Dec 23	-
				C236754745					
9	Auto Clave		ALP	CL-40L /	Technology Promotion Association	23TM763	27 Apr 23	25 Apr 24	-
				808763	(Thailand-Japan)				

Due Date of Calibration* : Based on the annual calibration plan. At least 1 time per year.



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TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert. No.: 23TM192

Page : 1 of 3

Certificate of Calibration

Equipment : Incubator

Manufacturer : Binder

Model : BD 53 E2

Serial No. : 13-07343

ID No. : UAE.MIC.005/2558

Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260

Location : Microbiology Laboratory

Received Order : 15 February 2023
Calibration Date : 15 February 2023
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %

Calibrated by : Suwit Imjai

Approved by :

Approved Signatory

() Pornthippa Tameyakul

(/) Malee Butkruea

Issue Date :

24 February 2023

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.

เอกสารไม่ควบคุม



Equipment : Incubator
 Condition As-Received : Used Item
 Reference : 2302-0295OC-1

Cert. No.: 23TM192
 Page : 2 of 3

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	Model	Serial No.	Cert. No.	Due Date
1) Data Acquisition	34972A	MY59003411	22LM165	26 Nov 2023

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

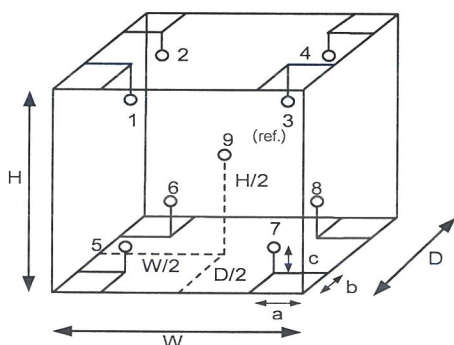
3. This certification is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

Environment during calibration		
	Beginning	Finished
Temp. (°C)	22	23
REL.Humid. (%)	65	61
AC Supply (Volt)	231	231



Probe Installation Details :

a = 5.0 cm
 b = 5.0 cm
 c = 5.0 cm

Dimension of Chamber :

D = 0.33 m
 W = 0.40 m
 H = 0.40 m
 Capacity = 0.053 m³

Position :	Ref. Std. ID No.:
1	20RTD-2/1
2	20RTD-2/2
3	20RTD-2/3
4	20RTD-2/4
5	20RTD-2/5
6	20RTD-2/6
7	20RTD-2/7
8	20RTD-2/8
9 (ref.)	20RTD-2/9

เอกสารไม่ควบคุม



Equipment : Incubator
Condition As-Received : Used Item
Reference : 2302-0295OC-1
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 23TM192

Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Uncertainty (± °C)	Coverage Factor <i>k</i>
35.0	35.4	35.4	0.037	0.56	0.86	0.30	2

Calibration Point (°C)	Measured Temperature (°C)								
	Position								
	1	2	3	4	5	6	7	8	9 (ref.)
35.0	35.256	35.308	35.116	35.453	34.700	34.798	34.718	34.657	34.938

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 %.

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert. No.: 23TM726

Page : 1 of 3

Certificate of Calibration

Equipment : Cooled Incubator

Manufacturer : Binder

Model : KB 400 E6

Serial No. : 20200000015535

ID No. : UAE.MIC.018/2564

Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260

Location : Microbiology Laboratory (302)

Received Order : 27 April 2023

Calibration Date : 27 April 2023

Ambient Temperature : $(26 \pm 10) ^\circ\text{C}$

Relative Humidity : $(50 \pm 30) \%$

Calibrated by : Tawatchai Pama

Approved by :

Approved Signatory

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

Issue Date :

12 May 2023

The Uncertainties are for a confidence probability of approximately 95%

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Equipment : Cooled Incubator

Condition As-Received : Used Item

Reference : 2304-0461OC-1

Cert. No.: 23TM726

Page : 2 of 3

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	Model	Serial No.	Cert. No.	Due Date
1) Data Acquisition	34972A	MY57013711	22LM93	02 Jul 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.

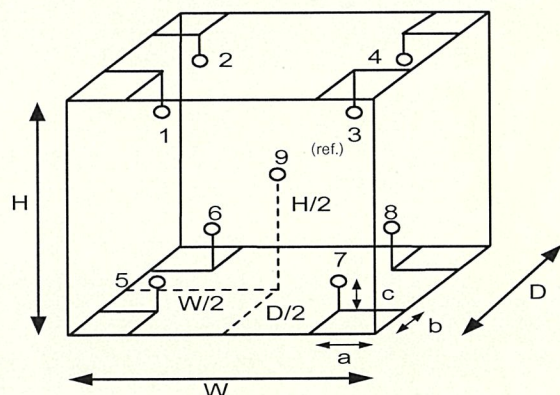
Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

Environment during calibration

	Beginning	Finished
Temp. (°C)	20	19
REL.Humid. (%)	72	82
AC Supply (Volt)	230	231



Position :	Ref. Std. ID No.:
1	22-18RTD-2/1
2	18RTD-2/2
3	18RTD-2/3
4	18RTD-2/4
5	18RTD-2/5
6	18RTD-2/6
7	18RTD-2/7
8	18RTD-2/8
9 (ref.)	18RTD-2/9

Probe Installation Details :

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

Dimension of Chamber :

D = 0.48 m
W = 0.65 m
H = 1.2 m
Capacity = 0.37 m³



Equipment : Cooled Incubator
Condition As-Received : Used Item
Reference : 2304-0461OC-1
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 23TM726

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	0.0090	0.16	0.21	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty
	Position									
	1	2	3	4	5	6	7	8	9 (ref.)	(± °C)
35.0	34.913	34.997	34.834	34.893	35.034	35.027	35.025	35.035	34.980	0.30

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 %.

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Cert. No.: 23TM727

Page : 1 of 3

Certificate of Calibration

Equipment : Incubator

Manufacturer : Memmert

Model : IF 75

Serial No. : D317.0305

ID No. : UAE.MIC.022/2561

Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260

Location : Microbiology Laboratory (302)

Received Order : 27 April 2023

Calibration Date : 27 - 28 April 2023

Ambient Temperature : (26 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by : Tawatchai Pama

Approved by :

Approved Signatory

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

Issue Date : 11 May 2023

The Uncertainties are for a confidence probability of approximately 95%

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Equipment : Incubator
Condition As-Received : Used Item
Reference : 2304-0461OC-4
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 23TM727

Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor <i>k</i>
44.0	44.0	44.0	0.055	0.42	0.52	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	Position									
	1	2	3	4	5	6	7	8	9 (ref.)	
44.0	43.993	44.061	44.107	44.073	44.067	44.067	43.938	43.687	44.060	0.30

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 %.

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เอกสารไม่คว



Equipment : Incubator
Condition As-Received : Used Item
Reference : 2304-0461OC-4

Cert. No.: 23TM727

Page : 2 of 3

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:-

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
1) Data Acquisition	34972A	MY57013711	22LM93	02 Jul 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.

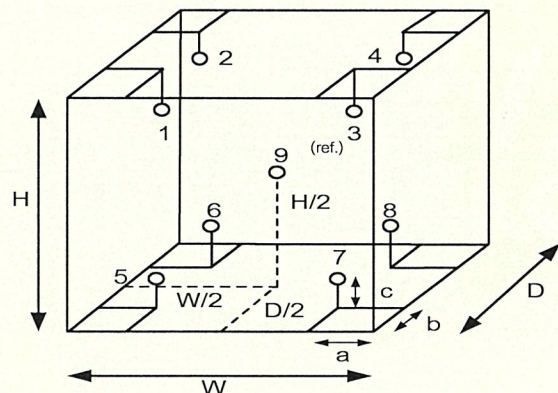
Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

Environment during calibration

	Beginning	Finished
Temp. (°C)	25	24
REL.Humid. (%)	76	80
AC Supply (Volt)	231	231



Position :	Ref. Std. ID No.:
1	18-18RTD-01
2	18-18RTD-02
3	18-18RTD-03
4	18-18RTD-04
5	18-18RTD-05
6	18-18RTD-10
7	18-18RTD-07
8	22-18RTD-08
9 (ref.)	18-18RTD-09

Probe Installation Details :

a = 5.0 cm
b = 5.0 cm
c = 5.0 cm

Dimension of Chamber :

D = 0.33 m
W = 0.40 m
H = 0.56 m
Capacity = 0.074 m³



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Cert. No.: 23TM765
Page : 1 of 3

Certificate of Calibration

Equipment : Incubator

Manufacturer : Memmert

Model : IN 75

Serial No. : D317.0307

ID No. : UAE.MIC.023/2561

Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260

Location : Microbiology Laboratory (302)

Received Order : 27 April 2023

Calibration Date : 27 April 2023

Ambient Temperature : (26 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by : Preecha Hlahib

Approved by :

Approved Signatory

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

Issue Date : 11 May 2023

The Uncertainties are for a confidence probability of approximately 95%

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Equipment : Incubator
Condition As-Received : Used Item
Reference : 2304-0461OC-5
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 23TM765

Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor <i>k</i>
37.0	37.0	37.0	0.070	0.28	0.39	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	Position									
	1	2	3	4	5	6	7	8	9 (ref.)	
37.0	37.164	37.118	37.079	37.121	36.852	37.039	36.822	36.923	36.905	0.30

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 %.

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Equipment : Incubator
Condition As-Received : Used Item
Reference : 2304-0461OC-5

Cert. No.: 23TM765

Page : 2 of 3

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:-

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
1) Data Acquisition	34972A	MY59003411	22LM165	26 Nov 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.

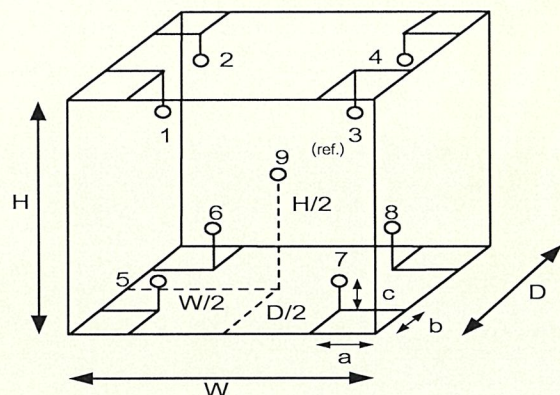
Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

Environment during calibration

	Beginning	Finished
Temp. (°C)	23	22
REL.Humid. (%)	69	73
AC Supply (Volt)	220	221



Position :	Ref. Std. ID No.:
1	20RTD-2/1
2	20RTD-2/2
3	20RTD-2/3
4	20RTD-2/4
5	20RTD-2/5
6	20RTD-2/6
7	20RTD-2/7
8	20RTD-2/8
9 (ref.)	20RTD-2/9

Probe Installation Details :

a = 5.0 cm
b = 5.0 cm
c = 5.0 cm

Dimension of Chamber :

D = 0.32 m
W = 0.42 m
H = 0.56 m
Capacity = 0.075 m³



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Cert. No.: 23TM378

Page : 1 of 3

Certificate of Calibration

Equipment : Incubator

Manufacturer : Memmert

Model : IPP 260

Serial No. : V615.0187

ID No. : UAE.MIC.003/2559

Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260

Location : Microbiology Laboratory

Received Order : 11 April 2023

Calibration Date : 12 April 2023

Ambient Temperature : (26 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by : Preecha Hlahib

Approved by :

Approved Signatory

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

Issue Date : 24 April 2023

The Uncertainties are for a confidence probability of approximately 95%

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Equipment : Incubator
Condition As-Received : Used Item
Reference : 2304-0155OC-1

Cert. No.: 23TM378

Page : 2 of 3

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	Model	Serial No.	Cert. No.	Due Date
1) Data Acquisition	34972A	MY49001451	23LM27	25 Feb 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.

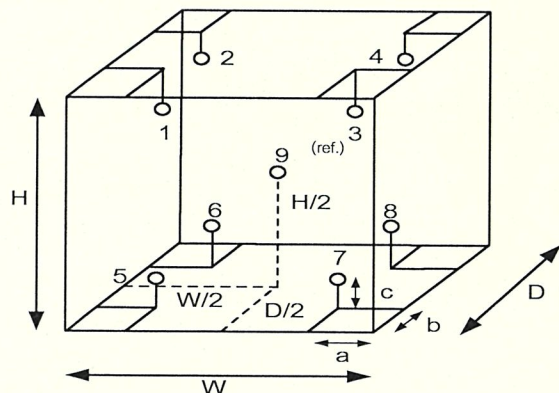
Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Not Available

Environment during calibration

	Beginning	Finished
Temp. (°C)	25	26
REL.Humid. (%)	57	61
AC Supply (Volt)	220	220



Position :	Ref. Std. ID No.:
1	19RTD-2/1
2	19RTD-2/2
3	19RTD-2/3
4	19RTD-2/4
5	19RTD-2/5
6	19RTD-2/6
7	19RTD-2/7
8	19RTD-2/8
9 (ref.)	19RTD-2/9

Probe Installation Details :

a = 5.0 cm
b = 5.0 cm
c = 5.0 cm

Dimension of Chamber :

D = 0.50 m
W = 0.64 m
H = 0.80 m
Capacity = 0.26 m³



Equipment : Incubator
Condition As-Received : Used Item
Reference : 2304-0155OC-1
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Not Available

Cert. No.: 23TM378

Page : 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor <i>k</i>
35.0	35.0	35.0	0.052	0.53	0.60	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	Position									
	1	2	3	4	5	6	7	8	9 (ref.)	
35.0	35.092	35.148	34.817	35.149	34.894	35.323	34.773	35.058	34.802	0.30

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 %.

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เอกสารไม่ควรถูก
ใช้ซ้ำ



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Cert. No.: 23TM374

Page : 1 of 3

Certificate of Calibration

Equipment : Water Bath

Manufacturer : Memmert

Model : WNE 14

Serial No. : L414.1407

ID No. : UAE.MIC.006/2558

Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260

Location : Microbiology Laboratory

Received Order : 11 April 2023

Calibration Date : 11 April 2023

Ambient Temperature : (26 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by : Krisda Malee

Approved by :

Approved Signatory

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

Issue Date :

24 April 2023

The Uncertainties are for a confidence probability of approximately 95%

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Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2304-0155OC-3
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Cert. No.: 23TM374

Page : 3 of 3

Calibration point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Average* Standard Reading (°C)					Uncertainty
			Position					
			1	2	3	4	5 (ref.)	(± °C)
44.5	44.5	44.5	44.508	44.466	44.456	44.478	44.483	0.15

Calibration point (°C)	Uniformity (°C)	Stability (± °C)	Coverage Factor <i>k</i>
44.5	0.065	0.031	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 %.

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เอกสารไม่ควบคุม



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2304-0155OC-3

Cert. No.: 23TM374

Page : 2 of 3

Procedure Used :-

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:-

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
1) Data Acquisition	34972A	MY59003411	22LM165	26 Nov 2023

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

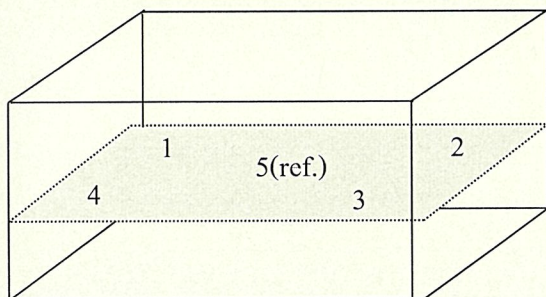
3. This certification is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Heat transfer medium used : Water

	<u>Environmental</u>		<u>AC Voltage Supply</u>
	(°C)	(%R.H.)	(Volt)
Beginning of Calibration	26	55	220
Finished of Calibration	25	56	221



Front

<u>Position :</u>	<u>Ref. Std. ID No.:</u>
1	4804539-001
2	4804539-002
3	4804539-003
4	4804539-004
5(ref.)	4804539-005

เอกสารไม่ควบคุม



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.: 23TM377

Page : 1 of 3

Certificate of Calibration

Equipment : Water Bath

Manufacturer : Memmert

Model : WNE 14

Serial No. : L414.1410

ID No. : UAE.MIC.007/2558

Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260

Location : Microbiology Laboratory (302)

Received Order : 11 April 2023

Calibration Date : 12 April 2023

Ambient Temperature : (26 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by : Preecha Hlahib

Approved by :

Approved Signatory

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

Issue Date : 24 April 2023

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.

เอกสารไม่ควบคุม

A 0053356



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2304-0155OC-4
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Cert. No.: 23TM377
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	44.494	44.459	44.477	44.507	44.498	0.15

Calibration point (°C)	Uniformity (°C)	Stability (± °C)	Coverage Factor <i>k</i>
44.5	0.13	0.056	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 %.

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เอกสารไม่ควบคุม

a 1158266



Equipment : Water Bath
Condition As-Received : Used Item
Reference : 2304-0155OC-4

Cert. No.: 23TM377

Page : 2 of 3

Procedure Used :-

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:-

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
1) Data Acquisition	34972A	MY49001451	23LM27	25 Feb 2024

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

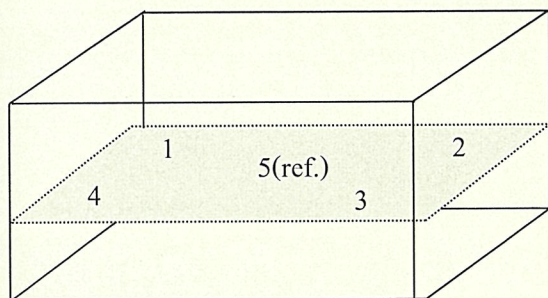
3. This certification is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Heat transfer medium used : Water

	<u>Environmental</u>		<u>AC Voltage Supply</u>
	(°C)	(%R.H.)	(Volt)
Beginning of Calibration	27	65	220
Finished of Calibration	30	70	221

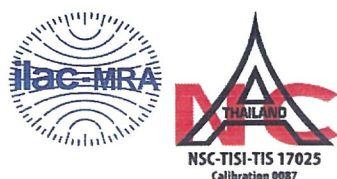


Front

<u>Position :</u>	<u>Ref. Std. ID No.:</u>
1	N37P301419
2	N37P300732
3	N37P301420
4	N37P301421
5(ref.)	N37P301425

เอกสารไม่ควบคุม

a 1158267



Certificate of Calibration

Equipment:	Balance	Certificate No.:	C01223732
Model:	PX623	Issued Date:	09 December 2022
Serial No. (or ID.):	C236754745	Job No.:	KSPR2215576
Manufacturer:	Ohaus	Page:	1 of 2
Condition:	New		

Customer: United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangchak Sub-District,
Phrakhanong District, Bangkok, THAILAND 10260

Environment Condition: Temperature 26 °C \pm 0.5 °C
Humidity 53 %RH \pm 3.9 %RH

Calibration Place: United Analyst and Engineering Consultant Co., Ltd. (301 Microbiology Room)
3 Soi Udomsuk 41, Sukhumvit Road, Bangchak Sub-District,
Phrakhanong District, Bangkok, THAILAND 10260

Calibration By: Mr. Adisai Maknoi

Calibration Date: 09 December 2022

The Method used: In-house method, CAL-WI-47, based on UKAS Lab 14

Traceability: This certificate is traceable to the SI Units maintained by National Institute of Metrology (NIMT), Thailand through DKSH Technology Co., Ltd. Certificate No. C02221765



Person in charge



Authorized signatory

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 DKSH Technology Limited.

Calibration Results:

Without Adjustment

Eccentric Error: Weight to be 1/3 or 1/2 of Maximum capacity, taken from the center of the pan as a zero reference.

			Nominal Test Value		200	(g)
Reference Points (g)						
A		B		C		D
-		0.000		0.000		0.000

Repeatability: Determination of the standard deviation of weighing balance., Readability 0.001 (g)

Nominal test value (g)	Standard Deviation
50	0.0004
500	0.0005

Error of indication from nominal or conventional mass value., Readability 0.001 (g)

Nominal Value (g)	Conventional Mass (g)	Displayed Value (g)	Error of Indication (g)	Uncertainty (g)	k
1	1.0000	1.000	0.000	0.0010	2.03
5	5.0001	5.000	0.000	0.0010	2.03
10	10.0001	10.000	0.000	0.0010	2.03
20	20.0001	20.000	0.000	0.0010	2.03
50	50.0001	50.000	0.000	0.0010	2.03
100	100.0001	100.000	0.000	0.0011	2.03
200	200.0004	200.000	0.000	0.0011	2.02
300	300.0005	300.000	-0.001	0.0013	2.01
400	400.0008	400.001	0.000	0.0014	2.01
500	500.0003	500.000	0.000	0.0017	2.00
600	600.0004	600.000	0.000	0.0019	2.00

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 indication 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, UKAS Lab14. 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

()
Authorized signatory

Statements of conformity:

Without Adjustment

Readability; 0.001 g

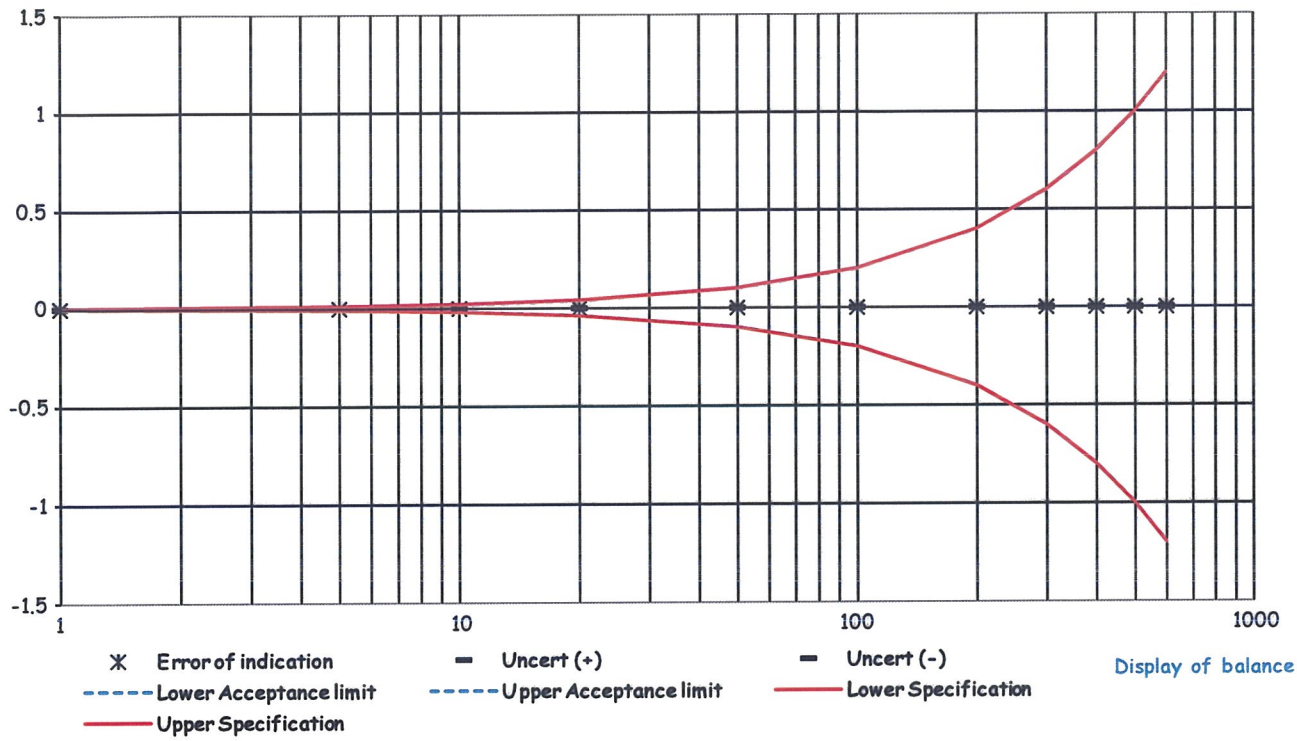
Nominal Value g	Error of indication g	Guard band (w) g	Tolerance (\pm) g	Conformity
1	0.000	0.0010	0.002	Pass
5	0.000	0.0010	0.010	Pass
10	0.000	0.0010	0.020	Pass
20	0.000	0.0010	0.040	Pass
50	0.000	0.0010	0.100	Pass
100	0.000	0.0011	0.200	Pass
200	0.000	0.0011	0.400	Pass
300	-0.001	0.0013	0.600	Pass
400	0.000	0.0014	0.800	Pass
500	0.000	0.0017	1.000	Pass
600	0.000	0.0019	1.200	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

Without Adjustment
Job No. KSPR2215576
Readability: 0.001g

Error of indication



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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
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TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert. No.: 23TM763

Page : 1 of 3

Certificate of Calibration

Equipment : Autoclave

Manufacturer : ALP

Model : CL-40L

Serial No. : 808763

ID No. : UAE.MIC.026/2563

Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak, Phrakhanong,
Bangkok 10260

Location : Microbiology Laboratory (301)

Received Order : 27 April 2023

Calibration Date : 27 April 2023

Ambient Temperature : (26 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by : Preecha Hlahib

Approved by :

Approved Signatory

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

Issue Date :

11 May 2023

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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A 0053944



Equipment : Autoclave
Condition As-Received : Used Item
Reference : 2304-04610C-2

Cert. No.: 23TM763

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:-

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
1) Data Acquisition	34972A	MY59003411	22LM165	26 Nov 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**

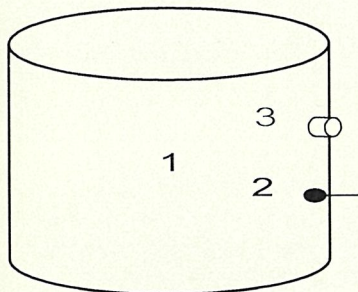
(** = Categorization of pathogens according to hazard and categories of containment, second edition, 1990)

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.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source



	<u>Environmental</u>		
	(°C)	(%R.H.)	(Volt)
Beginning of Calibration	27	60	220
Finished of Calibration	27	58	220

<u>Position</u>	<u>Description</u>	<u>Ref. Std. ID No.:</u>
1 =	Center of chamber	18-20TC-04
2 =	Temperature sensor	18-20TC-05
3 =	Exhaust port	18-20TC-06

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a 1159968



Equipment : Autoclave
Condition As-Received : Used Item
Reference : 2304-0461OC-2
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Cert. No.: 23TM763

Page : 3 of 3

Operating parameter Set : Temperature = 115.0 °C
Sterilization period = 15 minute

UUC* Setting (°C)	UUC* Reading (°C)	Position	Average* Standard Reading (°C)	Stability (± °C)	Pressure Reading (MPa)	Uncertainty (± °C)	Coverage Factor <i>k</i>
115.0	115.0	1	115.213	0.22	0.08	0.75	2
		2	115.166				
		3	115.260				

Operating parameter Set : Temperature = 121.0 °C
Sterilization period = 30 minute

UUC* Setting (°C)	UUC* Reading (°C)	Position	Average* Standard Reading (°C)	Stability (± °C)	Pressure Reading (MPa)	Uncertainty (± °C)	Coverage Factor <i>k</i>
121.0	121.0	1	121.260	0.29	1.1	0.75	2
		2	121.224				
		3	121.284				

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 %.

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a 1159967