

## List of Instrument Certificates for Environmental Quality Analysis

| No. | Instrument/Equipment           | Parameter                 | Manufacturer          | Model/Serial No.          | Calibrator  | Certification No. | Date of Calibration | Due date of Calibration* |
|-----|--------------------------------|---------------------------|-----------------------|---------------------------|---|-------------------|---------------------|--------------------------|
| 1   | Analytical Balance             | FAT OIL AND GREASE        | Mettler Toledo        | AB204-S/FACT / 1129361010 | United Analyst and Engineering Consultant Co., Ltd.     | 250422 1 BL002 25 | 23/4/2025           | 22/4/2026                |
| 2   | Analytical Balance             | TOTAL SUSPENDED SOLIDS    | Mettler Toledo        | XSR205DU / C009071872     | National Food Institute, Ministry of Industry, Thailand | 2502226-001-01    | 20/3/2025           | 19/3/2026                |
| 3   | BOD Incubator                  | BIOCHEMICAL OXYGEN DEMAND | ARCO                  | UC4-1320 / 1021           | Technology Promotion Association (Thailand-Japan)       | 24TM1114          | 11/7/2024           | 10/7/2025                |
| 4   | DO Meter                       | BIOCHEMICAL OXYGEN DEMAND | YSI                   | 5100 / 11B 101863         | Technology Promotion Association (Thailand-Japan)       | 25TW29            | 18/2/2025           | 16/2/2026                |
| 5   | Hot Air Oven                   | TOTAL SUSPENDED SOLIDS    | Memmert               | UF55 / B216.1666          | National Food Institute, Ministry of Industry, Thailand | 2500116-001-01    | 8/10/2024           | 7/10/2025                |
| 6   | Incubator                      | FECAL COLIFORM BACTERIA   | Binder                | KB400 / 20220000022479    | Technology Promotion Association (THAILAND-JAPAN)       | 24TM938           | 9/7/2024            | 8/7/2025                 |
| 7   | Kjeltec System Distilling Unit | AMMONIA-NITROGEN          | Foss Tecator (Labtec) | KT200 / 91790524          | FOSS South East Asia                                    | 13319             | 27/1/2025           | 26/1/2026                |
| 8   | pH Meter                       | pH                        | Horiba                | LAQUA-PH210 / HA0A0005    | technology promotion association (thailand-japan)       | 24CH1597          | 26/12/2024          | 24/12/2025               |
| 9   | Water Bath                     | FECAL COLIFORM BACTERIA   | Memmert               | WNE 14 / L414.1407        | Technology Promotion Association (Thailand-Japan)       | 25TM501           | 19/3/2025           | 18/3/2026                |

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



## Calibration Report

**Certificate No.:** 2502226-001-01  
**Equipment:** Electronic Balance  
**Manufacturer:** METTLER TOLEDO  
**Model:** XSR205DU  
**Resolution:** 0.00001 g / 0.0001 g  
**Serial No.:** C009071872  
**ID No.:** UAE.WAO.012/2563  
**Capacity:** 82 g / 220 g

**Date of Calibration:** 20 March 2025 **Page 2 of 4**

**Environment Condition:** Ambient Temperature: 21.2 ± 0.6 °C Relative Humidity: 48 ± 3.5 %

**Place of Calibration:** 208 Balance Room, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

**Condition of Equipment:** Good Condition

**Condition of This Results of Calibration:**

1. Calibration Method: NFI Method W-MA-001 In-House Method based on UKAS Lab 14 : 2019

2. Reference Standards:

**Reference Standard** **Model** **Serial No.** **Calibrated By** **Certificate No.** **Due Date**  
Standard Weight Class E2 1mg to 200g 8505567572 TCS M24041005 19 April 2025

**Instrument** **Model** **Serial No.** **Calibrated By** **Certificate No.** **Due Date**  
Thermo-Hygro Meter 608-H1 NFI.BTH 017/23 Quality Reborn QR25-0542 10 February 2026

3. This certification is traceable to SI UNIT

4. This certificate was certified only for the instrument we calibrated.

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

**Calibration Results:**

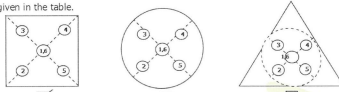
**1. Repeatability of Reading:**

| Nominal Value ( g ) | Standard Deviation of Reading ( g ) |
|---------------------|-------------------------------------|
| 40                  | 0.0000052                           |
| 80                  | 0.0000042                           |
| 100                 | 0.0000000                           |
| 200                 | 0.0000000                           |

**2. Off-Center Error:**

A mass of 100 g was placed and moved to various position on pan.

The balance reading obtained is given in the table.



| 1<br>( g ) | 2<br>( g ) | 3<br>( g ) | 4<br>( g ) | 5<br>( g ) | 6<br>( g ) | (Maximum Difference)<br>( g ) |
|------------|------------|------------|------------|------------|------------|-------------------------------|
| 100.0001   | 100.0001   | 100.0001   | 100.0001   | 100.0001   | 100.0002   | 0.0001                        |

F-CS-012 Revision: 01 Date: 20-04-65

เอกสารไม่ควบคุม



nfi.co.th

## Calibration Report

**Certificate No.:** 2502226-001-01  
**Equipment:** Electronic Balance  
**Manufacturer:** METTLER TOLEDO  
**Model:** XSR205DU  
**Resolution:** 0.00001 g / 0.0001 g  
**Serial No.:** C009071872  
**ID No.:** UAE.WAO.012/2563  
**Capacity:** 82 g / 220 g

**Date of Calibration:** 20 March 2025 **Page 4 of 4**

**Calibration Results:** (Continued)

**Calibration Range:** >80-200 g

**Calibration Adjustment:** Internal Calibration

**3. Departure from Nominal Value:** (Range: >80 - 200 g ; Resolution: 0.0001 g )

| Nominal Value ( g ) | Standard Value ( g ) | Average Reading ( g ) | Correction ( g ) | Uncertainty ( ± g ) | Coverage Factor k |
|---------------------|----------------------|-----------------------|------------------|---------------------|-------------------|
| 90                  | 90.00010             | 90.0002               | -0.0001          | 0.00015             | 2.00              |
| 100                 | 100.00006            | 100.0001              | 0.0000           | 0.00016             | 2.00              |
| 110                 | 110.00007            | 110.0001              | 0.0000           | 0.00017             | 2.00              |
| 120                 | 120.00009            | 120.0002              | -0.0001          | 0.00018             | 2.00              |
| 130                 | 130.00010            | 130.0002              | -0.0001          | 0.00019             | 2.00              |
| 140                 | 140.00013            | 140.0002              | -0.0001          | 0.00019             | 2.00              |
| 150                 | 150.00009            | 150.0002              | -0.0001          | 0.00021             | 2.00              |
| 160                 | 160.00010            | 160.0002              | -0.0001          | 0.00022             | 2.00              |
| 170                 | 170.00012            | 170.0002              | -0.0001          | 0.00023             | 2.00              |
| 200                 | 200.00013            | 200.0002              | -0.0001          | 0.00028             | 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 %.

----- End -----

F-CS-012 Revision: 01 Date: 20-04-65

เอกสารไม่ควบคุม



nfi.co.th

## Calibration Report

**Certificate No.:** 2502226-001-01  
**Equipment:** Electronic Balance  
**Manufacturer:** METTLER TOLEDO  
**Model:** XSR205DU  
**Resolution:** 0.00001 g / 0.0001 g  
**Serial No.:** C009071872  
**ID No.:** UAE.WAO.012/2563  
**Capacity:** 82 g / 220 g

**Date of Calibration:** 20 March 2025 **Page 3 of 4**

**Calibration Results:** (Continued)

**Calibration Range:** 0-80 g

**Calibration Adjustment:** Internal Calibration

**3. Departure from Nominal Value:** (Range: 0 - 82 g ; Resolution: 0.00001 g )

| Nominal Value ( g ) | Standard Value ( g ) | Average Reading ( g ) | Correction ( g ) | Uncertainty ( ± g ) | Coverage Factor k |
|---------------------|----------------------|-----------------------|------------------|---------------------|-------------------|
| Unload              | 0.000000             | 0.00000               | 0.00000          | 0.0000089           | 2.00              |
| 0.001               | 0.001003             | 0.00100               | 0.00000          | 0.0000092           | 2.00              |
| 0.005               | 0.005002             | 0.00500               | 0.00000          | 0.0000094           | 2.00              |
| 0.01                | 0.010003             | 0.01000               | 0.00000          | 0.0000091           | 2.00              |
| 0.05                | 0.049996             | 0.05000               | 0.00000          | 0.0000098           | 2.00              |
| 0.1                 | 0.100011             | 0.10000               | 0.00001          | 0.000011            | 2.00              |
| 0.5                 | 0.500016             | 0.50000               | 0.00002          | 0.000014            | 2.00              |
| 1                   | 1.000003             | 1.00001               | -0.00001         | 0.000016            | 2.00              |
| 2                   | 2.000023             | 2.00005               | -0.00003         | 0.000017            | 2.00              |
| 5                   | 5.000015             | 5.00005               | -0.00003         | 0.000021            | 2.00              |
| 10                  | 10.000009            | 10.00005              | -0.00004         | 0.000026            | 2.00              |
| 20                  | 20.000030            | 20.00012              | -0.00009         | 0.000037            | 2.00              |
| 30                  | 30.000039            | 30.00012              | -0.00008         | 0.000050            | 2.00              |
| 50                  | 50.000028            | 50.00014              | -0.00011         | 0.000068            | 2.00              |
| 80                  | 80.000067            | 80.00020              | -0.00013         | 0.00011             | 2.00              |

F-CS-012 Revision: 01 Date: 20-04-65

เอกสารไม่ควบคุม



nfi.co.th

## Certificate of Calibration

**Cert. No.:** 24TM1114  
**Page :** 1 of 3

**Equipment :** BOD Incubator  
**Manufacturer :** ARCO  
**Model :** UC4-1320  
**Serial No. :** -  
**ID No. :** UAE.WAO.018/2559  
**Submitted by :** United Analyst and Engineering Consultant Co.,Ltd.  
3 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Phrakhanong,  
Bangkok 10260  
**Location :** Lab Floor 2  
**Received Order :** 11 July 2024  
**Calibration Date :** 11 July 2024  
**Ambient Temperature :** ( 26 ± 10 ) °C  
**Relative Humidity :** ( 50 ± 30 ) %  
**Calibrated by :** Tawatthai Pama  
**Approved by :**   
Approved Signatory  
( ) Ponpan Palpim  
(✓) Suwit Imjai  
( ) Kunchit Promprat

**Issue Date :** 14 July 2024

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.

เอกสารไม่ควบคุม





Equipment : BOD Incubator  
Condition As-Received : Used Item  
Reference : 2407-0243OC-2

Cert. No.: 24TM1114  
Page : 2 of 3

#### Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 based on TLAS G-20 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 | MY49023932 | 23LM122   | TPA       | 26 Jul 2024 |

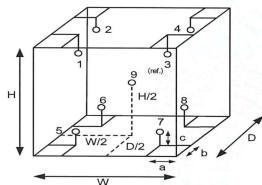
2. This certificate is valid only to the item calibrated on date and place of calibration.  
3. This certification is traceable to the International System of Unit.

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

Result of Calibration :- ( \* ) Without Adjustment

Function of UUC\* : Temperature Source

Fresh air setting : Not Available



| Environment during calibration |           |          |
|--------------------------------|-----------|----------|
|                                | Beginning | Finished |
| Temp. ( °C )                   | 29        | 29       |
| REL.Humid. ( % )               | 78        | 72       |
| AC Supply ( Volt )             | 233       | 234      |

| Position : | Ref. Std. ID No.: |
|------------|-------------------|
| 1          | 20-16RTD-10       |
| 2          | 20-16RTD-02       |
| 3          | 20-16RTD-03       |
| 4          | 23-16RTD-04       |
| 5          | 22-16RTD-05       |
| 6          | 20-16RTD-06       |
| 7          | 20-16RTD-07       |
| 8          | 22-16RTD-08       |
| 9 (ref.)   | 22-16RTD-09       |

#### Probe Installation Details :

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

#### Dimension of Chamber :

D = 0.62 m  
W = 1.2 m  
H = 1.2 m  
Capacity = 0.89 m<sup>3</sup>

เอกสารไม่ควบคุม



Equipment : BOD Incubator  
Condition As-Received : Used Item  
Reference : 2407-0243OC-2  
Result of Calibration :- ( \* ) Without Adjustment  
Function of UUC\* : Temperature Source  
Fresh air setting : Not Available

Cert. No.: 24TM1114  
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 |
|--------------------------|---------------------|---------------------|--------------------------------|-------------------------------|--------------------------|-------------------|
| 20.0                     | 20.0                | 19.9                | 0.29                           | 0.81                          | 1.2                      | 2                 |

| Calibration Point ( °C ) | Measured Temperature ( °C ) |        |        |        |        |        |        |        |          | Uncertainty ( ± °C ) |
|--------------------------|-----------------------------|--------|--------|--------|--------|--------|--------|--------|----------|----------------------|
|                          | 1                           | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9 (ref.) |                      |
| 20.0                     | 20.361                      | 19.640 | 20.312 | 20.079 | 19.908 | 19.872 | 19.955 | 19.818 | 19.758   | 0.48                 |

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-

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 FAX. 0-2719-9484

## Certificate of Testing

Cert.No.: 25TW29  
Page.: 1 of 2

Equipment : DO Meter  
Manufacturer : YSI  
Model : 5100  
Serial No. : 11B 101863  
ID No. : UAE.WAO.004/2554  
Received Date : 14 February 2025  
Test Date : 17 February 2025  
Reference : 2502-0473DSC-1  
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.  
3 Soi Udumsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260  
Laboratory Condition : Temperature ( 25 ± 5 ) °C  
Humidity ( 50 ± 20 ) %  
Test Procedure : In - house method : CP-CH9  
by Comparison Technique with Azide Modification Method

Tested by : Walalak Sirithean

Approved by :   
Approved Signatory

( ) Chakrit Waewwanjua  
( ) Ponpan Paipim  
(✓) Saitip Meangmai

Issue Date : 18 February 2025

เอกสารไม่ควบคุม



Cert.No.: 25TW29  
Page.: 2 of 2

#### Condition of this result of calibration

##### 1. 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.: 24F100202

| Titration Method<br>(Azide Modification Method)<br>(mg/L) | DO Meter<br>Reading<br>(mg/L) | Standard Deviation<br>(mg/L) |
|---|-------------------------------|------------------------------|
| 8.22  | 8.22                          | 0.0055                       |

This report was certified only for the instrument we tested.It is allowable to use for study  
Intend to use for advertising and referral purpose is prohibited.This report may not be reproduced  
other in full, without written approval of the laboratory

-o0o-

เอกสารไม่ควบคุม



## Calibration Certificate

**Certificate No.:** 2500116-001-01  
**Client name:** UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.  
**Address:** 3 Soi Udomsuk 41, Sukhumvit Road,  
 Bangchack, Prakhnong, Bangkok 10260

Page 1 of 3

|                      |                        |
|----------------------|------------------------|
| Equipment:           | CHAMBER (Hot Air Oven) |
| Manufacturer:        | MEMMERT                |
| Model:               | UF55                   |
| Serial No.:          | B216.1666              |
| ID No.:              | UAE.WAO.027/2559       |
| Order No.:           | 2500116                |
| Operation No.:       | 2500116-001            |
| Date of Receipt:     | 8 October 2024         |
| Date of Calibration: | 8 October 2024         |

**Calibrated by** Mr.Yothin Charoensuk Scientist  
**Approved by** ( Mr.Pheraphat Tuanjit )  
 Manager, Division of Calibration Laboratory  
 Responsible for the Technical Management Team  
**Date of Issue:** 15 October 2024

**The uncertainties are for a confidence probability of approximately 95 %.**

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

F-CS-009 Revision: 01 Date: 20-04-65

## เอกสารไม่ควบคุม

## เอกสารไม่ครบ



## Calibration Report

|                      |                        |             |                  |
|----------------------|------------------------|-------------|------------------|
| Certificate No.:     | 2500116-001-01         |             |                  |
| Equipment:           | CHAMBER (Hot Air Oven) |             |                  |
| Model:               | UF55                   | Serial No.: | B216.1666        |
| Resolution:          | 0.1 °C                 | ID No.:     | UAE.WAO.027/2559 |
|                      | Manufacturer:          | MEMMERT     |                  |
| Date of Calibration: | 8 October 2024         |             |                  |

|                               |  |
|-------------------------------|--|
| <b>Location:</b>              | Laboratory, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD. |
| <b>Environment Condition:</b> | Ambient Temperature ( 30.3 ± 1 ) °C                            |
|                               | Relative Humidity ( 55 ± 1 ) %                                 |
|                               | Line Voltage ( 230 ± 3 ) Volt                                  |

**Condition of this results of Calibration:**

1. This instrument was calibrated by insert 9 standard thermometer into its chamber and calibration according to W-TE-014 Based on TLAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.

- The Temperature scale used was based on ITS - 90.
- All data show below were final values and the initial data may be obtained upon request.

## 2. Reference Standard Instrument :

| Instrument                         | Model  | Serial No./ID No.       | Certificate No. | Due Date    | Through                    |
|------------------------------------|--------|-------------------------|-----------------|-------------|----------------------------|
| Digital Thermometer<br>with sensor | 34972A | MY57003188              | TE 670486-01    | 8 June 2025 | NATIONAL FOOD<br>INSTITUTE |
|                                    | RTD    | CH#201-209/ RTD#201-209 |                 |             |                            |

3. This certificate is traceable to International System of Units (SI Units).
4. This certificate was certified only for the instrument we calibrated.
5. This result of calibration was found accurate as shown on date and place of calibration only.
6. Condition of Calibrated item :      Good

UUC Description :

|                  |   |               |          |        |                              |
|------------------|---|---------------|----------|--------|------------------------------|
| Time of Record   | 1 | Hour          | 9        | Minute | At 104.0, 140.0 and 180.0 °C |
| Fresh air Damper | - | Open          | Position | -      |                              |
|                  | X | Close         | Fan      | 40%    |                              |
|                  | - | Not Available |          |        |                              |

7. Result of Calibration :

|  |   |                    |  |                  |
|--|---|--------------------|--|------------------|
|  | X | Without adjustment |  | After adjustment |
|--|---|--------------------|--|------------------|

F-CS-012 Revision: 01 Date: 20-04-65

## เอกสารไม่ควบคุม



## Calibration Report

|                  |                        |             |                  |
|------------------|------------------------|-------------|------------------|
| Certificate No.: | 2500116-001-01         |             |                  |
| Equipment:       | CHAMBER (Hot Air Oven) |             |                  |
| Model:           | UF55                   | Serial No.: | B216.1666        |
| Resolution:      | 0.1 °C                 | ID No.:     | UAE.WAO.027/2559 |
| Manufacturer:    | MEMMERT                |             |                  |

|                      |                           |
|----------------------|---------------------------|
| Date of Calibration: | 8 October 2024            |
| Calibration point:   | 104.0, 140.0 and 180.0 °C |

| Calibration Condition | Temperature (°C) | Relative Humidity (%) | Line Voltage (Volt) |
|-----------------------|------------------|-----------------------|---------------------|
| MIN                   | 29.3             | 54                    | 227.0               |
| MAX                   | 31.2             | 56                    | 232.0               |

Table1 : Reporting of Temperature

| Calibration point<br>(°C) | Measured Temperature (°C) @ Sensor No.<br>(Sensor No.9 is REF) |        |        |        |        |        |        |        |        | Uncertainty<br>± (°C) |
|---------------------------|--|--------|--------|--------|--------|--------|--------|--------|--------|-----------------------|
|                           | # 1  | # 2    | # 3    | # 4    | # 5    | # 6    | # 7    | # 8    | # 9    |                       |
| 104.0                     | 103.89   | 103.66 | 103.88 | 103.89 | 104.40 | 103.98 | 103.70 | 104.10 | 104.15 | 0.53                  |
| 140.0                     | 139.85   | 139.53 | 139.87 | 139.88 | 140.67 | 140.00 | 139.60 | 140.25 | 140.23 | 0.73                  |
| 180.0                     | 179.63   | 179.22 | 179.71 | 179.76 | 181.03 | 180.06 | 179.41 | 180.87 | 180.39 | 0.90                  |

Table 2 : Reporting of Characterization Result

| UUC* Setting<br>(°C) | UUC* Reading (°C) |       |         | Stability<br>± (°C) | Uniformity<br>(°C) | Overall Variation<br>(°C) |
|----------------------|-------------------|-------|---------|---------------------|--------------------|---------------------------|
|                      | MIN               | MAX   | Average |                     |                    |                           |
| 104.0                | 104.0             | 104.0 | 104.0   | 0.15                | 0.49               | 0.88                      |
| 140.0                | 140.0             | 140.0 | 140.0   | 0.13                | 0.71               | 1.2                       |
| 180.0                | 180.0             | 180.0 | 180.0   | 0.13                | 1.2                | 1.9                       |

**Note** The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "  
UUC\* = Unit Under Calibration

UUC\* = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.

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.

**Overall Variation** = The difference of the maximum and minimum measured temperatures throughout observation time.

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

----- End -----

F-CS-012 Revision: 01 Date: 20-04-65

เอกสารไม่ครบคุณ





## Certificate of Calibration

Cert. No.: 24TM938  
Page : 1 of 3

Equipment : Incubator  
Manufacturer : Binder  
Model : KB 400 E6  
Serial No. : 2022000022479  
ID No. : UAE.MIC.028/2566  
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.  
3 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Phrakhanong,  
Bangkok 10260  
Location : Microbiology Laboratory  
Received Order : 09 July 2024  
Calibration Date : 09 July 2024  
Ambient Temperature : ( 26 ± 10 ) °C  
Relative Humidity : ( 50 ± 30 ) %

Calibrated by : Khit Ruttanaprapachai

Approved by :

( ) Ponpan Paipim  
(✓) Suwit Imjai  
( ) Kunchit Promprat

Issue Date : 19 July 2024

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.

เอกสารไม่ควบคุม



Equipment : Incubator  
Condition As-Received : Used Item  
Reference : 2407-0153OC-4

Cert. No.: 24TM938  
Page : 2 of 3

### Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 based on TLAS G-20 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 | MY49001451 | 24LM44    | TPA       | 17 Mar 2025 |

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.

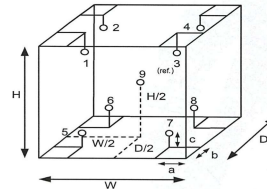
Remark : TPA : Technology Promotion Association ( Thailand - Japan )

Result of Calibration :- ( \* ) Without Adjustment

Function of UUC\* : Temperature Source

Fresh air setting : Not Available

| Environment during calibration |           |          |
|--------------------------------|-----------|----------|
|                                | Beginning | Finished |
| Temp. ( °C )                   | 23        | 24       |
| REL.Humid. ( % )               | 52        | 54       |
| AC Supply ( Volt )             | 221       | 222      |



### Probe Installation Details :

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

### Dimension of Chamber :

D = 0.47 m  
W = 0.65 m  
H = 1.2 m  
Capacity = 0.37 m<sup>3</sup>

| 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          | 24-19RTD-2/6      |
| 7          | 19RTD-2/7         |
| 8          | 19RTD-2/8         |
| 9 (ref.)   | 19RTD-2/9         |

เอกสารไม่ควบคุม



Equipment : Incubator  
Condition As-Received : Used Item  
Reference : 2407-0153OC-4  
Result of Calibration :- ( \* ) Without Adjustment  
Function of UUC\* : Temperature Source  
Fresh air setting : Not Available

Cert. No.: 24TM938  
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                | 0.030                          | 0.31                          | 0.33                     | 2                 |

| Calibration Point ( °C ) | Measured Temperature ( °C ) |        |        |        |        |        |        |        |          | Uncertainty ( ± °C ) |
|--------------------------|-----------------------------|--------|--------|--------|--------|--------|--------|--------|----------|----------------------|
|                          | 1                           | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9 (ref.) |                      |
| 35.0                     | 35.093                      | 35.011 | 35.081 | 35.118 | 34.840 | 35.054 | 34.924 | 34.978 | 34.824   | 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 %.

-000-

เอกสารไม่ควบคุม

# FOSS

## Customer Service Report

FOSS South East Asia  
3388 Sirinrat Building, 25th - 26th Floor, Unit No. 3388/90,  
Rama IV Road, Klongton, Klongtoey, Bangkok, Thailand 10110

Report No.: 13319

Customer: UAE

Address: Bangkok

Serial: 91790524

Date: Jan 27, 2025  
Job No.: 11675  
Instrument: KT200

| Start  | Travel To Customer (Hrs) |   | Labour (Hrs) | Travel From Customer (Hrs) |
|--------|--------------------------|---|--------------|----------------------------|
|        | 09:00                    | 1 | 10:00        | 3                          |
| Finish | 10:00                    |   | 13:00        |                            |

| Application     | Job Type |                    |          |          |
|-----------------|----------|--------------------|----------|----------|
|                 | Special  | Standard           | Training | In House |
| Distributor     | x        | Courtesy Visit     | x        | x        |
| Digital Service | x        | PMA Onboarding     | x        | x        |
| Internal        | x        | Warranty           | x        | x        |
| Investigate     | x        | Sales Support      | x        | x        |
|                 |          | Remote             | x        | x        |
|                 |          | Health Check Visit | x        | x        |

| PMA Type | Smartcare         | Smartcare Pro | Fosscore |
|----------|-------------------|---------------|----------|
|          | x                 | x             | x        |
|          | Smartcare Advance | Fosscore Pro  | N/A      |

| Details of Work / Test                |    |   |         |
|---------------------------------------|----|---|---------|
| - DM -                                |    |   |         |
| + Visual Check                        |    |   |         |
| - No leak                             |    |   |         |
| - have damage on heater & main switch |    |   |         |
| + replace heater 10. main switch      |    |   |         |
| + 11. replace pen kit                 |    |   |         |
| + Function Check                      |    |   |         |
| - Power on / off                      |    |   |         |
| - Alarm                               |    |   |         |
| - Steam                               |    |   |         |
| - Condenser                           |    |   |         |
| Instrument Ready for Use              | OK | x | Not OK* |

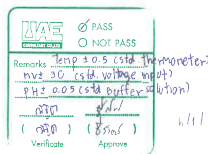
| Part No. | Batch      | Description                                 | Qty |
|----------|------------|---|-----|
| 10069965 | 11.06.2024 | FOSS PM KIT KT200 Reflector Analyser / 2100 | 1   |
| 10003512 | 26.03.2024 | Heating element Steam                       | 1   |
| 15630111 | 10.10.2022 | Unit for R595 kit + 2 fan                   | 1   |

| I confirm this report is accurate and complete |  |                 |  |
|--|--|-----------------|--|
| Signed FOSS                                    |  | Signed Customer |  |
| Name   |  | Name            |  |

|         |                   |
|---------|-------------------|
| Email:  | Customer Contact: |
| Remark: |                   |

เอกสารไม่ควบคุม





## Certificate of Calibration

Cert.No.: 24CH1597  
Page.: 1 of 3

Equipment : pH Meter  
Manufacturer : Horiba  
Model : LAQUA-PH210  
Serial No. : HA0A0005  
ID No. : UAE.EFM.004/2563(EFM.pH.04/63)  
Condition As-Received: Used Item  
Received Date : 24 December 2024  
Calibration Date : 26 December 2024  
Reference : 2412-0601WSC-2  
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.  
3 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Phrakhanong, Bangkok 10260

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 standard

Calibrated by : Warakorn Lernagatrakul

Approved by :   
Approved Signatory

( ) Pornthippa Tameyakul  
( ) Ponpan Paipim  
(✓) Sathip Meangmai

Issue Date : 27 December 2024

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.

Cert.No.: 24CH1597  
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 | 54030049   | 130RC116 | 24E2759   | 25 Aug 2025  |
| 2)Ref. Standard Thermometer   | 4982054    | 110RC044 | 24I757    | 14 July 2025 |

- This Certification is traceable to SI Through Technology Promotion Association (Thailand - Japan)

#### 2. Certified Reference Materials

:The measurement results are traceable to SI through Hach Lenge GmbH Ltd.,  
Deutsche Akkreditierungsstelle, Accredited No.D-RM-15184-01-00  
: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        | 1034203 | 27 Sep 2026  |
| pH 7.000        | Hach Lenge GmbH | C03185  | 09 July 2026 |
| pH 10.010       | CPA chem        | 1034205 | 27 Sep 2025  |

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)(7,10)

| Unit Under Calibration     | Nominal Value | Standard Voltage Input | Actual Reading |       | Uncertainty of Measurement | Coverage factor |
|----------------------------|---------------|------------------------|----------------|-------|----------------------------|-----------------|
|                            | pH            | mV                     | mV             | pH    | (±mV)                      | k               |
| pH Meter<br>S/N.: HA0A0005 | 4.00          | 177.48                 | 177.4          | 4.01  | 0.058                      | 2.00            |
|                            | 7.00          | 0.00                   | 0.1            | 7.00  | 0.058                      | 2.00            |
|                            | 7.00          | 0.00                   | 0.1            | 7.00  | 0.058                      | 2.00            |
|                            | 10.00         | -177.48                | -177.2         | 10.01 | 0.058                      | 2.00            |

Cert.No.: 24CH1597  
Page.: 3 of 3

### Calibration Results

#### Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7)(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<br>S/N.: - | 4.008                       | 4.01              | 177.2                  | 0.0079                            | 2.00              |
|                         | 7.000                       | 7.00              | 2.2                    | 0.0092                            | 2.00              |
|                         | 7.000                       | 7.00              | 2.2                    | 0.0085                            | 2.00              |
|                         | 10.010                      | 10.01             | -170.9                 | 0.0095                            | 2.00              |

#### Function : Temperature Measurement

(\*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : -  
- Serial No. : -  
Dimension of probe  
- Length : 112 mm.  
- Diameter : 16 mm.  
- Immersion Depth : 100 mm.

| Calibration Point (°C) | Standard Temperature (°C) | UUC* Reading (°C) | Error (°C) | Uncertainty of measurement (± °C) | Coverage factor k |
|------------------------|---------------------------|-------------------|------------|-----------------------------------|-------------------|
| 15.0                   | 15.003                    | 15.0              | -0.003     | 0.13                              | 2.00              |
| 30.0                   | 30.001                    | 30.0              | -0.001     | 0.13                              | 2.00              |
| 45.0                   | 45.002                    | 45.0              | -0.002     | 0.13                              | 2.00              |

Remark : UUC\* = Unit Under Calibration

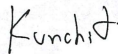
The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.





## Certificate of Calibration

Cert. No.: 25TM501  
Page : 1 of 3

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 Udumsuk 41, Sukhumvit Road,  
Bangchak, Phrakhanong,  
Bangkok 10260  
Location : Microbiology Laboratory (302)  
Received Order : 19 March 2025  
Calibration Date : 19 March 2025  
Ambient Temperature : ( 26 ± 10 ) °C  
Relative Humidity : ( 50 ± 30 ) %  
AC Line Voltage : ( 220 ± 22 ) V  
Calibrated by : Krisda Malee  
Approved by :   
( ) Chakrit Waewwanjua  
( ) Suwit Imjai  
(✓) Kunchit Promprat  
Issue Date : 27 March 2025

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.

เอกสารไม่ควบคุม



Equipment : Water Bath  
Condition As-Received : Used Item  
Reference : 2503-0436OC-1  
Procedure Used :-

Cert. No.: 25TM501  
Page : 2 of 3

Calibration were conducted using in-house calibration procedure CP-OT04 Based on ASTM E715 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 | MY57013823 | 23LM71    | TPA       | 12 May 2025 |

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.

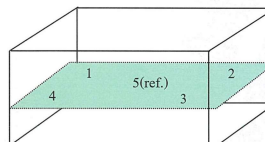
Remark : TPA : Technology Promotion Association ( Thailand - Japan )

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 | 24            | 50        | 220               |
| Finished of Calibration  | 25            | 53        | 221               |



Front

| Position : | Ref. Std. S/N.: |
|------------|-----------------|
| 1          | 4804539-006     |
| 2          | 4804539-007     |
| 3          | 4804539-008     |
| 4          | 4804539-009     |
| 5(ref.)    | 4804539-010     |

เอกสารไม่ควบคุม



Equipment : Water Bath  
Condition As-Received : Used Item  
Reference : 2503-0436OC-1  
Result of Calibration :- ( \* ) Without Adjustment  
Function of UUC\* : Temperature Source

Cert. No.: 25TM501  
Page : 3 of 3

| Calibration point<br>( °C ) | UUC* Setting<br>( °C ) | UUC* Reading<br>( °C ) | Average* Standard Reading ( °C ) |        |        |        |          | Uncertainty<br>( ± °C ) |
|-----------------------------|------------------------|------------------------|----------------------------------|--------|--------|--------|----------|-------------------------|
|                             |                        |                        | Position                         |        |        |        |          |                         |
|                             |                        |                        | 1                                | 2      | 3      | 4      | 5 (ref.) |                         |
| 44.5                        | 44.4                   | 44.4                   | 44.508                           | 44.531 | 44.495 | 44.537 | 44.510   | 0.15                    |

| Calibration point ( °C ) | Uniformity ( °C ) | Stability ( ± °C ) | Coverage Factor k |
|--------------------------|-------------------|--------------------|-------------------|
| 44.5                     | 0.092             | 0.048              | 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 %.

-o0o-

เอกสารไม่ควบคุม