

ภาคผนวก ค : เอกสารสอบเทียบความถูกต้อง  
ของเครื่องมือเก็บตัวอย่าง

## CERTIFICATE OF CALIBRATION

Certificate No.:

Page 1 of total 4 pages

Customer

|              |   |        |                   |
|--------------|---|--------|-------------------|
| Equipment    | pH Meter                                |        |                   |
| Manufacturer | METTLER TOLEDO                          | Model  | SevenCompact S220 |
| Serial No.   | B327527211                              | ID No. | WWL 0068          |
| Description  | Range : 0 - 14 pH, Resolution : 0.01 pH |        |                   |

|                          |                       |                             |
|--------------------------|-----------------------|-----------------------------|
| Environmental Conditions | Ambient Temperature:  | $(20 \pm 2) ^\circ\text{C}$ |
|                          | Relative Humidity:    | $(50 \pm 10) \%$            |
|                          | Atmospheric Pressure: | -                           |

Calibration Location Jayhawks Laboratory (CL&GL)

Received Date 19 August 2022

Calibration Date 19 August 2022

Date of Issue 22 August 2022

This calibration certificate shall not be reproduced other than in full except with the prior written approval of the Thai Heart Calibration Co., Ltd.

Certificate No.:



Page 2 of total 4 pages

**Reference Method:**

- The calibration method used was CP-178 based on an in-house method.
- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

**Reference Standard:**

| Type                 | pH Value | Lot No. | Due Date      | Traceability |
|----------------------|----------|---------|---------------|--------------|
| pH Standard Solution | 4.01     | 081020  | Jan. 22, 2023 | NIMT         |
|                      | 7.01     | 020221  | Jan. 18, 2023 |              |
|                      | 10.00    | 091020  | Feb. 7, 2023  |              |

| Type                            | Model       | Serial No.            | Certificate No. | Due Date     | Traceability |
|---------------------------------|-------------|-----------------------|-----------------|--------------|--------------|
| Documenting Process Calibrator  | 753         | 3101007               | 10-0804001/22   | Apr. 7, 2023 | THC          |
| Digital Thermometer with Sensor | 1523 / 5622 | 1709138 / 4605984-005 | 10-1006004/22   | Jun. 9, 2023 |              |

Remark: This certificate is traceable to the International System of Unit (SI Unit) through:

- NIMT, National Institute of Metrology (Thailand).
- THC, Thai Heart Calibration Co., Ltd.

**Measurement Results:**

**1. Function Simulated pH Meter**

| Standard Applied<br>( mV ) | Nominal Value<br>( pH ) | UUC Reading |        | Uncertainty<br>( ± mV ) |
|----------------------------|-------------------------|-------------|--------|-------------------------|
|                            |                         | pH          | mV     |                         |
| 177.48                     | 4.00                    | 4.01        | 177.4  | 0.060                   |
| 0.00                       | 7.00                    | 7.00        | 0.0    | 0.060                   |
| -177.48                    | 10.00                   | 10.01       | -177.4 | 0.060                   |

UUC : Unit Under Calibration

Note : Adjust Curve to simulate pH (4,7,10)

Calibrated by



Certificate No.:



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Measurement Results (Cont.):

2. Calibration of pH Electrode (Serial No.: 3322791)

| pH Standard Solution<br>( pH ) | Measured Value |        | Uncertainty<br>( ± pH ) |
|--------------------------------|----------------|--------|-------------------------|
|                                | ( pH )         | ( mV ) |                         |
| 4.01                           | 4.01           | 185.9  | 0.013                   |
| 7.01                           | 7.01           | 9.3    | 0.013                   |
| 10.00                          | 10.01          | -164.9 | 0.013                   |

Note : Adjust Curve to Buffer Solution pH (4,7,10)

Temperature stability of micro bath :  $25 \pm 0.2^{\circ}\text{C}$

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2.00$ , providing a level of confidence approximately 95%.

Calibrated by





Certificate No.:



Page 4 of total 4 pages

**Reference Method:**

- The calibration method used was CP-096 based on an in-house method.
- The temperature scale used was an ITS-90.
- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

**Reference Standard Instruments:**

| Type                            | Model     | Serial No. | Cert. No.     | Due Date      | Traceability |
|---------------------------------|-----------|------------|---------------|---------------|--------------|
| Thermometer Readout             | 1529-R    | B7C853     | I0-1011001/21 | Nov. 10, 2022 | THC          |
| Platinum Resistance Thermometer | 5626      | 4854       | C0A30047      | Oct. 22, 2023 | FLUKE        |
| Liquid Bath                     | XORTS-40A | XO111019   | I0-0306002/21 | Jun. 3, 2023  | THC          |

**Remark:** This certificate is traceable to the International System of Unit (SI Unit) through:

- THC, Thai Heart Calibration Co., Ltd.
- FLUKE, Fluke Comporation, U.S.A.

**Measurement Results:**

( X ) Without Adjustment

Dimension of probe : Diameter 4 mm. Sensor Type : RTD (PT100)

| Immersion Depth (mm.) | Standard Reading (°C) | UUC Reading (°C) | Correction (°C) | Uncertainty (± °C) |
|-----------------------|-----------------------|------------------|-----------------|--------------------|
| 120                   | 22.00                 | 22.0             | 0.00            | 0.060              |
| 120                   | 25.00                 | 25.0             | 0.00            | 0.060              |
| 120                   | 28.00                 | 28.0             | 0.00            | 0.060              |

UUC : Unit Under Calibration

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2.00$ , providing a level of confidence approximately 95%.

- End of Certificate -

Calibrated by



## CERTIFICATE OF CALIBRATION

Certificate No.:

of total 2 pages

Customer

**Equipment** Conductivity Meter

**Manufacturer** EUTECH

**Model** CON 2700

**Serial No.** 2657889

**ID No.** WWL 0136

**Description** -

**Environmental Conditions** Ambient Temperature:  $(20 \pm 2) ^\circ\text{C}$

Relative Humidity:  $(50 \pm 10) \%$

Atmospheric Pressure: -

**Calibration Location** Jayhawks Laboratory (CL&GL)

**Received Date** 20 July 2022

**Calibration Date** 20 July 2022

**Date of Issue** 21 July 2022

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Certificate No.:

Page 2 of total 2 pages

#### Reference Method:

- The calibration method used was CP-177 based on an in-house method.
- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

#### Reference Standard :

| Material                       | Batch Value            | Lot Number | Due Date      | Traceability |
|--------------------------------|------------------------|------------|---------------|--------------|
| Conductivity Standard Solution | 151.1 $\mu\text{S/cm}$ | S211008031 | Jan. 18, 2023 | SCP Science  |
|                                | 1.421 mS/cm            | S220112015 | May 16, 2023  |              |

Remark: This certificate is traceable to the International System of Unit (SI Unit) through:

- SCP Science.

#### Measurement Results:

| Conductivity Standard Solution | Measured Value         | Correction           | Uncertainty ( $\pm$ ) |
|--------------------------------|------------------------|----------------------|-----------------------|
| 151.1 $\mu\text{S/cm}$         | 150.9 $\mu\text{S/cm}$ | 0.2 $\mu\text{S/cm}$ | 1.5 $\mu\text{S/cm}$  |
| 1.421 mS/cm                    | 1.423 mS/cm            | -0.002 mS/cm         | 0.0052 mS/cm          |

Note : Adjustment points: 151.1 $\mu\text{S/cm}$  1.421mS/cm

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2.00$ , providing a level of confidence approximately 95%.

- End of Certificate -

929,929/1 Soi Pattanakarn 30, Pattanakarn Rd., Suanluang, Suanluang, Bangkok 10250  
Head Office : Tel. 02-319-9994 ext.1 Fax.02-318-4961 E-mail : atsc@automation.co.th  
Rayong Branch : 1/15 Huaypong Rd., A. Muang, Rayong 21150 Tel. 038-692-152 Fax. 038-692-345  
Lamphun Branch : 122/5 M.4, T.Ban Klang, A.Muang, Lamphun 51000 Tel/Fax. 053-581-876  
website : www.automation.co.th

SV 212001/2021

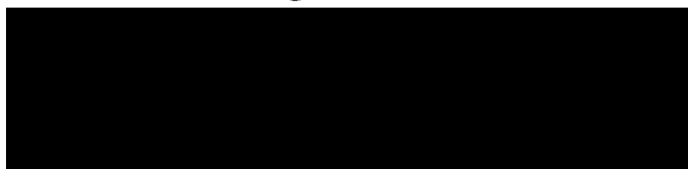
Cert. No. WAC-065

Page 1 of 2

## CERTIFICATE OF CALIBRATION

Instrument : DO Meter Machine : -  
Model : DO-31P Location : -  
Serial No. : 780065  
Manufacturer : TOA-DKK  
Measuring Range : 0.00 ~ 20.00 mg/l

Customer :

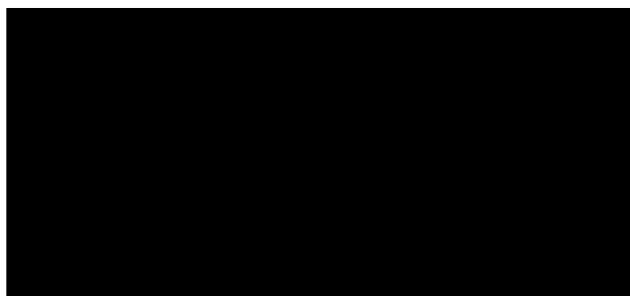


Date Of Received : 03 / 12 / 2021

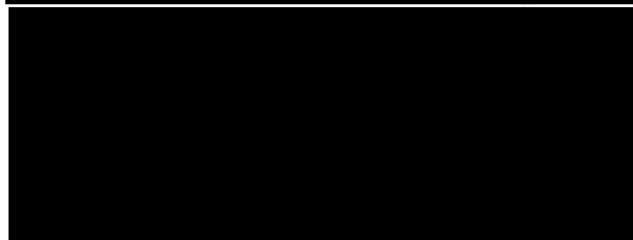
Date Of Calibration : 03 / 12 / 2021

Ambient Condition : Temperature 24 °C  
Humidity 47 % RH

Calibrated By :



Approved By :



Date Of Issue : 03 / 12 / 2021

This Certificate may not be reproduced other than in full, except with the prior written approval of the head of the industrial instruments calibration center.

Instrument : DO Meter  
Model : DO-31P  
Serial No. : 780065

Cert. No. WAC-065  
Page 2 of 2

**Calibrate Procedure**

- ☐ This instrument was calibrated by comparison with standard solution (PH/ORP)  
☐ This instrument was calibrated by comparison with scattering plate value (Turbidity)  
☐ This instrument was calibrated by comparison with conductivity (Conductivity)  
☒ This instrument was calibrated by comparison with Sodium sulfite anhydrous (DO)

**Condition of this result of calibration**

**1). Reference Standard Solution**

| <u>Standard</u>      | <u>Lot No</u> | <u>Batch.</u> | <u>Cert. No.</u> | <u>Due Date</u> |
|----------------------|---------------|---------------|------------------|-----------------|
| Sodium Sulfite Power | 1.06657.0500  | K52300357     | -                | 31 Mar 2022     |

**2). Traceability This certification is traceable to**

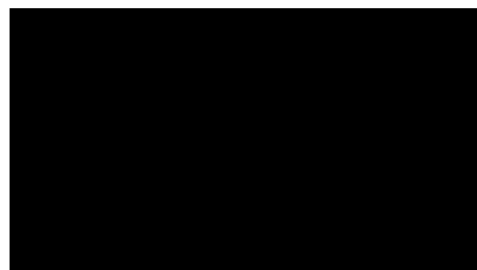
- ☒ Merck KGaA 64271 Darmstadt  
☐ DKK Corporation

**Result Of Calibration**

| Standard Solution<br>(mg/l) at 26.0°C |      | Before Adjust |        | After Adjust |       |
|---------------------------------------|------|---------------|--------|--------------|-------|
|                                       |      | Indicator     | Error  | Indicator    | Error |
| Zero                                  | 0.00 | 0.10          | + 0.10 | 0.00         | -     |
| Span                                  | 7.99 | 8.21          | + 0.22 | 7.99         | -     |

DO Electrode No. OE270AA(5) S/N 111F0029

Calibrated By



# Certificate of Calibration

## TEMPERATURE CONTROLLER ENCLOSURES



NSC-TISI-TIS 17025  
CALIBRATION 0183

Certificate No.: MC 2207678

Page 1 of 3

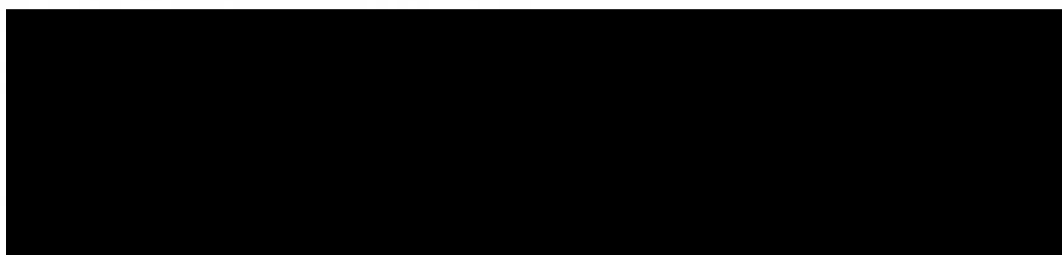


Customer



Reference Job No. : 22-1601 Received Date : 12 July 2022  
Description : Refrigerator  
Manufacturer : SANDENINTERCOOL Model : SEC-1500SBD  
Serial No. : SEC1500201A-0708-00304 ID. No. : WWL0038  
Marking : Additionally for the purpose of identification by this laboratory a label marked  
with this certificate number ( MC 2207678 ) has been attached to the case.  
Method : In-House calibration procedure MWI-T-033 this method is reference to  
TLAS G-20 "Temperature Controlled Enclosures".  
Location of Calibration : Water Analysis Center Co., Ltd. ; Laboratory.  
Environmental Conditions : Ambient Temperature : ( 25.8 to 27.5 ) °C  
Relative Humidity : ( 48.8 to 52.2 ) %  
Date of Calibration : 12 July 2022 Date of Issue : 19 July 2022

Checked by :



The uncertainties are for a confidence probability of approximately 95%

This certificate is issued in accordance with the conditions of accreditation granted by the National Standardization Council of Thailand-Office of the National Standardization Council that 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 Master Calibration Co.,Ltd.

Certificate No.: MC 2207678

Page 2 of 3

### The Reference Standard :

| Description                                    | Certificate No. | Serial No. | Due date         |
|--|-----------------|------------|------------------|
| Data Acquisition/Switch Unit                   | MC 2114432      | MY44096104 | 20 December 2022 |
| With Thermocouple Type " T " ID. No.2/1 to 2/9 |                 |            |                  |

This certificate is traceable to the international system of units maintained at:

- Master Calibration Co., Ltd.

### 1. Calibration Procedure:

This Instrument was calibration according to TLAS G-20 by comparison with calibrated thermocouple type T under no load condition. The Thermocouples were placed on nine points and located one thermocouple in each of the eight corners of the chamber and was away from the each wall of 5 cm to 10 cm. And placed the ninth thermocouple within 2.5 cm of the geometric center of the chamber.

*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. The reference sensor should preferably be located at the geometric center of the chamber.

*Temperature Stability* - one-half of the greatest maximum difference of measured temperatures at any one sensor.

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

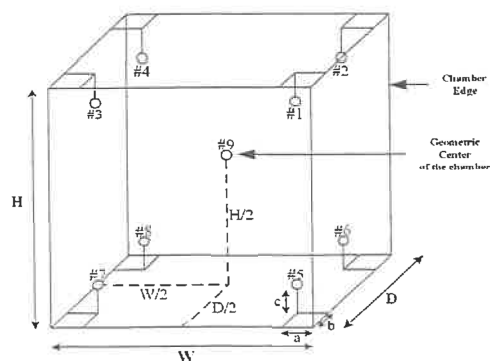


Figure 1 : Sensor Installation Location

Overall Ambient Temperature around the Chamber variation : 3.4 °C

Overall Line Voltage variation : 0.1 V

Chamber Size (W\*H\*D) : 171 cm x 157 cm x 60 cm

Checked by :



Certificate No.: MC 2207678

Page 3 of 3

## 2. Result of calibration :

### Temperature Measurement Accuracy Test

| Indicating<br>Temperature<br>(°C) | Measured Temperature (°C) at Spread Locations |     |     |     |     |     |     |     |         | Uncertainty<br>(±°C) |
|-----------------------------------|---|-----|-----|-----|-----|-----|-----|-----|---------|----------------------|
|                                   | #1  | #2  | #3  | #4  | #5  | #6  | #7  | #8  | Ref. #9 |                      |
| 2.5                               | 3.5   | 3.6 | 3.7 | 3.5 | 3.6 | 3.4 | 3.4 | 3.3 | 3.4     | 1.1                  |

### Chamber Characterization Result

| Controller<br>Temperature<br>(°C) | Indicating<br>Temperature<br>(°C) | Temperature<br>Stability<br>(±°C) | Temperature<br>Uniformity<br>(°C) | Overall<br>Variation<br>(°C) |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|------------------------------|
| 2.0                               | 2.5                               | 1.5                               | 0.6                               | 3.1                          |

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

**This report will certify of the calibrated equipment only.**

**End of Certificate**

Checked by :





## Certificate of Calibration

### TEMPERATURE CONTROLLER ENCLOSURES

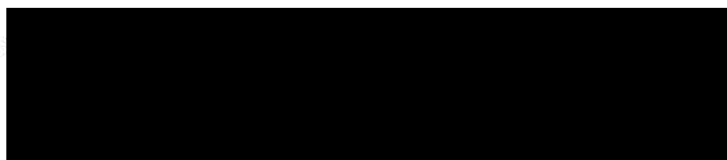


Certificate No.: MC 2203933

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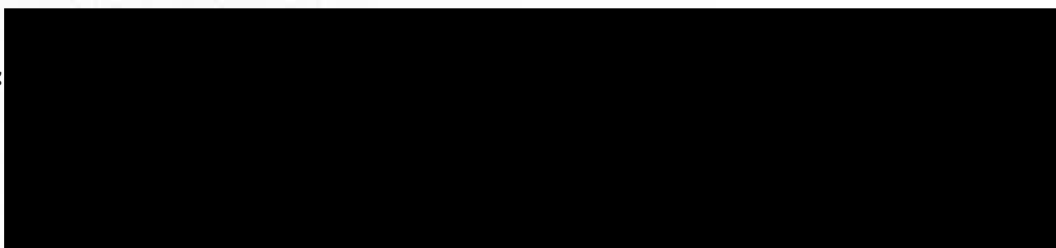


Customer



Reference Job No. : 22-0740 Received Date : 24 March 2022  
Description : Oven  
Manufacturer : Memmert Model : UF260  
Serial No. : B620.0814 ID. No. : WWL0212  
Marking : Additionally for the purpose of identification by this laboratory a label marked  
with this certificate number ( MC 2203933 ) has been attached to the case.  
Method : In-House calibration procedure MWI-T-033 this method is reference to  
TLAS G-20 "Temperature Controlled Enclosures".  
Location of Calibration : Water Analysis Center Co., Ltd. ; Laboratory.  
Environmental Conditions : Ambient Temperature : ( 30.5 to 32.6 ) °C  
Relative Humidity : ( 56.2 to 61.2 ) %  
Date of Calibration : 24 March 2022 Date of Issue : 28 March 2022

Checked by :



The uncertainties are for a confidence probability of approximately 95%

This certificate is issued in accordance with the conditions of accreditation granted by the National Standardization Council of Thailand-Office of the National Standardization Council that 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 Master Calibration Co.,Ltd.

Certificate No.: MC 2203933

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### The Reference Standard :

| Description                                      | Certificate No. | Serial No. | Due date      |
|--|-----------------|------------|---------------|
| Data Acquisition/Switch Unit                     | MC 2106035      | 93000641   | 8 August 2022 |
| With Thermocouple Type " T " ID. No.30/1 to 30/9 |                 |            |               |

This certificate is traceable to the international system of units maintained at:

- Master Calibration Co., Ltd.

### 1. Calibration Procedure:

This Instrument was calibration according to TLAS G-20 by comparison with calibrated thermocouple type T under no load condition. The Thermocouples were placed on nine points and located one thermocouple in each of the eight corners of the chamber and was away from the each wall of 5 cm to 10 cm. And placed the ninth thermocouple within 2.5 cm of the geometric center of the chamber.

*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. The reference sensor should preferably be located at the geometric center of the chamber.

*Temperature Stability* - one-half of the greatest maximum difference of measured temperatures at any one sensor.

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

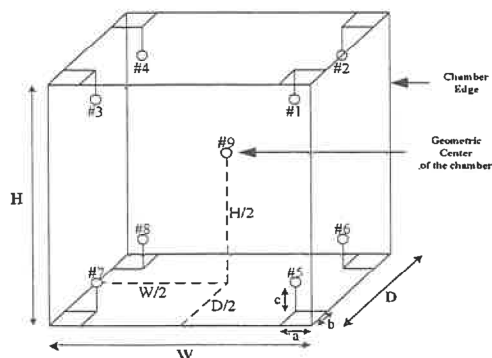


Figure 1 : Sensor Installation Location

Overall Ambient Temperature around the Chamber variation : 1.1 °C

Overall Line Voltage variation : 0.2 V

Chamber Size (W\*H\*D) : 65 cm x 80 cm x 50 cm

Checked by



Certificate No.:

Page 3 of 3

## 2. Result of calibration :

### Temperature Measurement Accuracy Test

| Indicating Temperature<br>(°C) | Measured Temperature (°C) at Spread Locations |       |       |       |       |       |       |       |         | Uncertainty<br>(±°C) |
|--------------------------------|---|-------|-------|-------|-------|-------|-------|-------|---------|----------------------|
|                                | #1  | #2    | #3    | #4    | #5    | #6    | #7    | #8    | Ref. #9 |                      |
| 104.0                          | 103.9   | 103.9 | 103.9 | 104.1 | 104.3 | 104.2 | 104.2 | 104.1 | 104.0   | 0.67                 |
| 180.0                          | 179.3   | 179.3 | 179.3 | 179.5 | 180.1 | 180.3 | 180.5 | 180.4 | 180.1   | 0.99                 |

### Chamber Characterization Result

| Controller Temperature<br>(°C) | Indicating Temperature<br>(°C) | Temperature Stability<br>(±°C) | Temperature Uniformity<br>(°C) | Overall Variation<br>(°C) |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------|
| 104.0                          | 104.0                          | 0.27                           | 0.45                           | 0.92                      |
| 180.0                          | 180.0                          | 0.29                           | 1.00                           | 1.65                      |

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

**This report will certify of the calibrated equipment only.**

**End of Certificate**

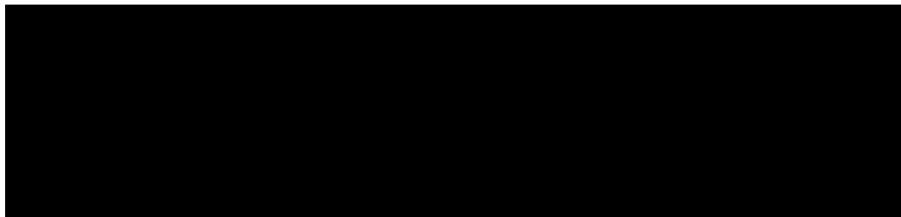
Checked by :



# Certificate of Calibration

|                             |                     |                         |              |
|-----------------------------|---------------------|-------------------------|--------------|
| <b>Equipment:</b>           | Balance             | <b>Certificate No.:</b> | C01221685    |
| <b>Model:</b>               | BL210S              | <b>Issued Date:</b>     | 08 June 2022 |
| <b>Serial No. (or ID.):</b> | 15808131 (WWL 0022) | <b>Job No.:</b>         | KSPR2206906  |
| <b>Manufacturer:</b>        | Sartorius           | <b>Page:</b>            | 1 of 2       |
| <b>Condition:</b>           | In condition        |                         |              |

**Customer:**



**Environment Condition:**

|             |        |           |
|-------------|--------|-----------|
| Temperature | 27 °C  | ± 0.5 °C  |
| Humidity    | 42 %RH | ± 4.7 %RH |

**Calibration Place:** Water Analysis Center Co., Ltd. ( ห้องเครื่องชั่ง )  
1/94 Moo 5, Rojana Industrial Park, Rojana Road,  
Tambol Kanham, Amphur U-Thai, Ayutthaya 13210 Thailand

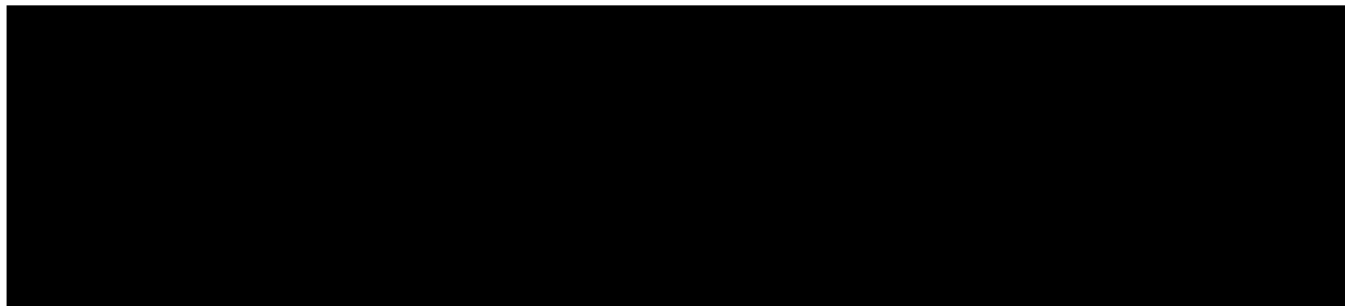
**Calibration By:**



**Calibration Date:** 08 June 2022

**The Method used:** In-house method, SPCC-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 SPC RT Co., Ltd. Certificate No. C02220794



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 SPC RT Co., Ltd.

### 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 |  |  | Reference Points (g) |        |        |         |         |
|--------------------|--|--|----------------------|--------|--------|---------|---------|
| 100                |  |  | (g)                  |        |        |         |         |
|                    |  |  | A                    | B      | C      | D       | E       |
|                    |  |  | -                    | 0.0001 | 0.0001 | -0.0002 | -0.0002 |

**Repeatability:** Determination of the standard deviation of weighing balance., Readability 0.0001 (g)

| Nominal test value (g) | Standard Deviation |
|------------------------|--------------------|
| 20                     | 0.00004            |
| 200                    | 0.00004            |

**Error of Indication from nominal or conventional mass value.,** Readability 0.0001 (g)

| Nominal Value<br>(g) | Conventional Mass<br>(g) | Displayed Value<br>(g) | Error of Indication<br>(g) | Uncertainty<br>(g) | k    |
|----------------------|--------------------------|------------------------|----------------------------|--------------------|------|
| 1                    | 0.99998                  | 1.0000                 | 0.0000                     | 0.000097           | 2.02 |
| 2                    | 1.99999                  | 2.0000                 | 0.0000                     | 0.000098           | 2.02 |
| 5                    | 5.00000                  | 5.0000                 | 0.0000                     | 0.000099           | 2.02 |
| 10                   | 10.00002                 | 10.0000                | 0.0000                     | 0.00010            | 2.02 |
| 20                   | 19.99995                 | 20.0000                | 0.0000                     | 0.00011            | 2.01 |
| 50                   | 50.00002                 | 50.0000                | 0.0000                     | 0.00012            | 2.01 |
| 70                   | 69.99997                 | 70.0000                | 0.0000                     | 0.00015            | 2.00 |
| 100                  | 100.00007                | 100.0001               | 0.0000                     | 0.00017            | 2.00 |
| 120                  | 120.00002                | 120.0000               | 0.0000                     | 0.00020            | 2.00 |
| 150                  | 150.00009                | 150.0002               | 0.0001                     | 0.00023            | 2.00 |
| 200                  | 199.99993                | 200.0003               | 0.0004                     | 0.00029            | 2.00 |

**The End of Certificate**

# Certificate of Calibration

Number of Page(s) 1 of 3

**Certificate No.** BSCC-UV-149/22  
**Equipment** UV/Vis Spectrophotometer  
**Model** UV-1800  
**Manufacturer** Shimadzu  
**Serial No.** A11635405598CD  
**ID No.** WWL0082  
**Date of receipt** 29 April 2022  
**Date of calibration** 29 April 2022  
**Date of issue** 6 May 2022

**Customer name**

**Address**

**Temperature** (29.9-31.8) °C (On site)  
**Humidity** (48.7-52.6) %RH (On site)

**Equipment condition** Good Operation

**Calibration Location** Laboratory Room Water Analysis Center

**Calibration Procedure** In-house method WI-UV-702-01 based on ASTM E275-01

**Traceability** Wavelength Accuracy is traceable to certificate No. 95917 and 95918  
Photometric Accuracy is traceable to certificate No. 95924 and 95937  
Stray Light is traceable to certificate No. 95908  
The above certificate are traceable to SI unit through Sarna Scientific Ltd.  
(UKAS accredited calibration laboratory NO. 0659)

**Calibrated by**

The above results are valid exclusively for the calibrated item(s) as mention in this report / certificate.  
Advertising the report / Certificate and publicity of the results are prohibited and also shall not be reproduced  
except in full, without written approval of the Bara Scientific Co., Ltd.

# Certificate of Calibration

Certificate No.

BSCC-UV-149/22

Number of Page(s)

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## Calibration Results:

### 1.Wavelength Accuracy

| Certified Wavelength (nm) | UUC (nm) | Error (nm) | Uncertainty ( $\pm$ nm) |
|---------------------------|----------|------------|-------------------------|
| 360.89                    | 360.86   | -0.03      | 0.18                    |
| 418.53                    | 418.72   | 0.19       | 0.18                    |
| 445.82                    | 446.51   | 0.69       | 0.18                    |
| 453.67                    | 453.56   | -0.11      | 0.18                    |
| 459.99                    | 459.81   | -0.18      | 0.18                    |
| 638.00                    | 638.17   | 0.17       | 0.18                    |
| 431.22                    | 431.52   | 0.30       | 0.18                    |
| 513.39                    | 513.60   | 0.21       | 0.18                    |
| 528.90                    | 528.80   | -0.10      | 0.18                    |
| 572.99                    | 576.13   | 3.14       | 0.18                    |
| 585.25                    | 585.30   | 0.04       | 0.18                    |
| 684.50                    | 684.68   | 0.18       | 0.18                    |
| 741.02                    | 741.22   | 0.20       | 0.18                    |
| 879.41                    | 879.30   | -0.11      | 0.18                    |

### 2.Photometric Accuracy (UV)

| Wavelength (nm) | Certified Absorbance (A) | UUC (A) | Error (A) | Uncertainty ( $\pm$ A) |
|-----------------|--------------------------|---------|-----------|------------------------|
| 235             | CNR                      | CNR     | CNR       | CNR                    |
|                 | CNR                      | CNR     | CNR       | CNR                    |
| 257             | CNR                      | CNR     | CNR       | CNR                    |
|                 | CNR                      | CNR     | CNR       | CNR                    |
| 313             | CNR                      | CNR     | CNR       | CNR                    |
|                 | CNR                      | CNR     | CNR       | CNR                    |
| 350             | 0.0000                   | 0.0000  | 0.0000    | 0.0075                 |
|                 | 0.6429                   | 0.6404  | -0.0025   | 0.0075                 |

\*CNR = Customer not request

The above results are valid exclusively for the calibrated item(s) as mention in this report / certificate.  
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# Certificate of Calibration

Certificate No. **BSCC-UV-149/22**

Number of Page(s)

3 of 3

## Calibration Results:

### 3. Photometric Accuracy (Visible)

| Wavelength (nm) | Certified Absorbance (A) | UUC (A) | Error (A) | Uncertainty ( $\pm A$ ) |
|-----------------|--------------------------|---------|-----------|-------------------------|
| 420.0           | 0.0000                   | 0.0000  | 0.0000    | 0.0042                  |
|                 | 0.5783                   | 0.5806  | 0.0023    | 0.0042                  |
|                 | 0.7628                   | 0.7650  | 0.0022    | 0.0042                  |
|                 | 1.0206                   | 1.0245  | 0.0039    | 0.0042                  |
| 440.0           | 0.0000                   | 0.0000  | 0.0000    | 0.0042                  |
|                 | 0.5621                   | 0.5635  | 0.0014    | 0.0042                  |
|                 | 0.7455                   | 0.7466  | 0.0011    | 0.0042                  |
|                 | 0.9985                   | 1.0007  | 0.0022    | 0.0042                  |
| 465.0           | 0.0000                   | 0.0000  | 0.0000    | 0.0042                  |
|                 | 0.5227                   | 0.5240  | 0.0013    | 0.0042                  |
|                 | 0.6880                   | 0.6895  | 0.0015    | 0.0042                  |
|                 | 0.9487                   | 0.9508  | 0.0021    | 0.0042                  |
| 546.1           | 0.0000                   | 0.0000  | 0.0000    | 0.0042                  |
|                 | 0.5207                   | 0.5205  | -0.0002   | 0.0042                  |
|                 | 0.6973                   | 0.6966  | -0.0007   | 0.0042                  |
|                 | 0.9959                   | 0.9955  | -0.0004   | 0.0042                  |
| 590.0           | 0.0000                   | 0.0000  | 0.0000    | 0.0042                  |
|                 | 0.5544                   | 0.5536  | -0.0008   | 0.0042                  |
|                 | 0.7253                   | 0.7240  | -0.0013   | 0.0042                  |
|                 | 1.0942                   | 1.0924  | -0.0018   | 0.0042                  |
| 635.0           | 0.0000                   | 0.0000  | 0.0000    | 0.0042                  |
|                 | 0.5616                   | 0.5609  | -0.0007   | 0.0042                  |
|                 | 0.6927                   | 0.6915  | -0.0012   | 0.0042                  |
|                 | 1.0881                   | 1.0869  | -0.0012   | 0.0042                  |

\*CNR = Customer not request

### 4. Stray Light\*

| Standard cut-off wavelength (nm) | Unit Under Calibration(UUC) |                   |                |
|----------------------------------|-----------------------------|-------------------|----------------|
|                                  | Wavelength (nm)             | Transmission (%T) | Absorbance (A) |
| 200.96 $\pm$ 0.11nm              | 199.31                      | 0.9668            | 2.0147         |

The Stray light transmission reference is less than 1.0%T and Stray light absorbance reference is greater than 2.00A

\*Stray Light not NSC-ONSC Accredited.

The measurement uncertainty is base on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%.

**\*\*\*End of Certificate\*\*\***

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80-82 Prachathipatai Rd., Bangkhunphrom, Pranakorn, Bangkok 10200

Tel. 0-2629-0191-6, 0-2280-1787, Fax. 0-2280-1788, E-mail : thawan@thaiunique.com, Website : www.thaiunique.com

### PREVENTATIVE MAINTENANCE (PM) CHECK LIST

#### FOR ATOMIC ABSORPTION SPECTROMETER

Model & Serial Num

Customer :

Date: 10 กพ 22

#### Safety

- ☒ Flame, Inspect/replace o-ring nebulizer, spray chamber and burner
- ☒ Flame, Clean nebulizer, spray chamber and burner
- ☒ Flame, Check liquid trap interlock, burner interlock, pressure relief bung interlock and shield interlock
- ☐ Furnace, Clean work head , electrode and shroud N/A
- ☐ Furnace, Clean PSD and PSD tray N/A
- ☐ Furnace, Check water pressure N/A
- ☒ Check drain tube
- ☒ Check exhaust system
- ☒ Check gas pressure sensor interlock
- ☒ Check and all gas hoses for SpectrAA
- ☒ Clean computer control

#### Optics

- ☒ Inspect/Replace that external optics surfaces
- ☒ Check Wavelength Accuracy the copper line at 323.0-326.0 nm = 324.8 nm
- ☒ Check that PMT % Gain the copper at 324.8 nm, 4 mA, 0.5 nm slit width, Gain = 36% (should be  $\leq 64\%$  or  $\leq 380V$ )
- ☒ Flame, Check D2 lamp is work



Electronics

- ☒ Check power supply voltage
- ☒ Check cables and connectors
- ☒ Check/Clean all boards in the instrument
- ☐ Furnace, Check camera and align\*\* N/A

\*\*Option for Graphite Zeeman only

Mechanisms

- ☒ Flame, Check the burner adjuster
- ☐ Furnace, Check PSD accessories N/A

Analytical performance

- ☒ Clear the sample compartment
- ☒ Flame, Check uptake rate form 7.2-10.6 mL per minute = 9.5 mL/min
- ☒ Test Photometric noise, STDV = 0.0003 Abs (should be  $\leq 0.00050$  Abs)
- ☒ Flame, Test high solids nebulizer setting use

-Air/acet Cu 5 ppm = 0.77 Abs, and Precision

(%RSD)= 0.4 % (should be  $> 0.55$  Abs and  $< 0.5\%$  RSD)

or

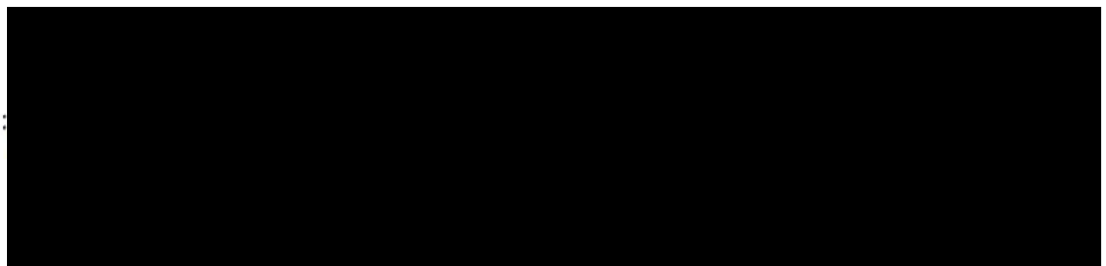
-N20/Acet Cu 5 ppm = \_\_\_\_\_ Abs, and Precision

(%RSD)= \_\_\_\_\_ % (should be  $> 0.3$  Abs and  $< 0.5\%$  RSD)

- ☐ Furnace, Characteristic mass and sensitivity Cu 25 ppb = \_\_\_\_\_ Abs, and N/A  
Precision (%RSD)= \_\_\_\_\_ % (should be  $\geq 0.15$  Abs and  $\leq 4.0\%$  RSD)

SIGN :

Engineer :



# SVD Results Report



Report ID:1 Diagnostic Start Time:10/2/2022 11:56:32 Diagnostic End Time:10/2/2022 12:36:59

Customer

Address

## Instrument Configuration

### Configuration:

|   |  |
|---|--|
| <b>Serial Number:</b> AA0911M073              | <b>Turret Type:</b> Automatic              |
| <b>Instrument Model:</b> Varian AA140/240/280 | <b>Number Of Lamps:</b> 4                  |
| <b>Flame Instrument:</b> True                 | <b>Mono Type:</b> Automatic                |
| <b>Furnace Instrument:</b> True               | <b>Gasbox Type:</b> 'Y' Gas Box            |
| <b>Zeeman Present:</b> False                  | <b>Auto Burner Adjuster:</b> False         |
| <b>Internal Zeeman:</b> False                 | <b>Mains Frequency:</b> 50                 |
| <b>Internal UltrAA:</b> False                 | <b>Firmware Version:</b> 2.12              |
| <b>Optics Type:</b> Double Beam               | <b>Photomultiplier Type:</b> Normal(900nm) |
| <b>D2 BG Correction Fitted:</b> True          | <b>PWB Version:</b> 181                    |
| <b>Boot Block Version:</b> 2.02               |  |

### EEPROM Data:

|  |                                     |
|--|-------------------------------------|
| <b>Instrument Run Hours:</b> 29533.551 | <b>D2 Run Hours:</b> 4026.533       |
| <b>Zero Wavelength Offset:</b> -18.735 | <b>D2 Serial Number:</b> not set !  |
| <b>Mono Correction:</b> -0.360         | <b>D2 Install Date:</b> 1/1/1970    |
| <b>Flame Hours:</b> 7417.833           | <b>D2 Original Intensity:</b> 1.000 |
|  | <b>D2 Last Intensity:</b> 678.000   |

### Frequency:

|                                 |  |
|---------------------------------|--|
| <b>Averaging Period:</b> 30.0   |  |
| <b>Datapoint Count:</b> 20      |  |
| <b>Upper Limit:</b> 51.00       | <b>Highest Measured Frequency:</b> 50.00 |
| <b>Average Frequency:</b> 50.00 |  |
| <b>Lower Limit:</b> 49.00       | <b>Lowest Measured Frequency:</b> 50.00  |

**Result:** Passed

---

## Power Supply:

**Averaging Period:** 30.0

**Datapoint Count:** 20

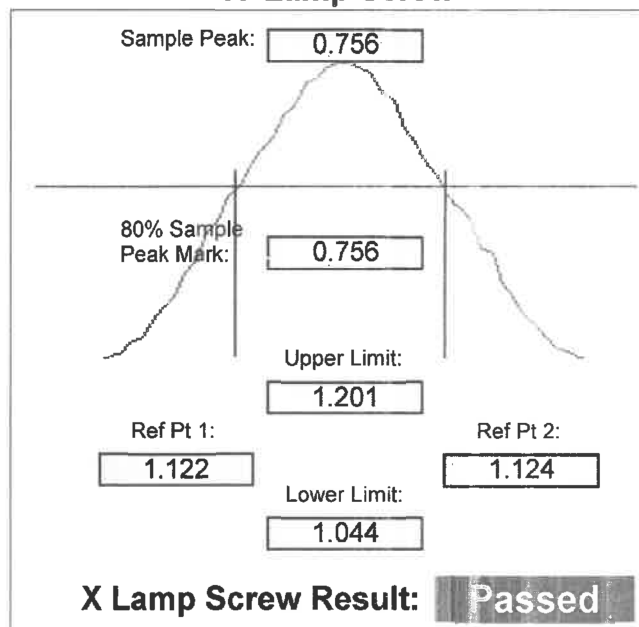
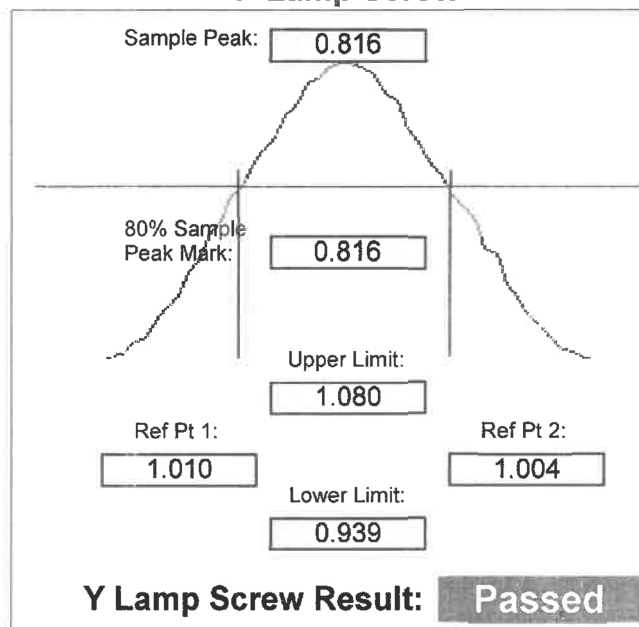
|                      | Lower Limit (V) | Actual (V)    | Upper Limit (V) | Result:       |
|----------------------|-----------------|---------------|-----------------|---------------|
| <b>12.00 V Rail</b>  | 10.80           | <b>12.20</b>  | 13.20           | <b>Passed</b> |
| <b>-12.00 V Rail</b> | -13.20          | <b>-12.00</b> | -10.80          | <b>Passed</b> |
| <b>5.00 V Rail</b>   | 4.50            | <b>5.10</b>   | 5.50            | <b>Passed</b> |
| <b>310.00 V Rail</b> | 279.00          | <b>318.00</b> | 341.00          | <b>Passed</b> |

---

**Beam Balance:**

**Lamp Type:** Copper  
**Lamp Socket Used:** 3

**Peak Selected:** 324.80  
**Lamp Alignment:** Performed

**'X' Lamp Screw****'Y' Lamp Screw****Grating Squareness:**

**Lamp Element(s):** Copper

**Lamp Turret Position:** 3

**Lamp Current(mA):** 4.00

**Slit Width(nm):** 0.5

**1st Order Wavelength(nm):** 324.80

**Lamp Alignment:** Performed

|              | Lower Limit (nm) | Actual (nm) | Upper Limit (nm) | Result: |
|--------------|------------------|-------------|------------------|---------|
| Zero Order   | -0.10            | 0.00        | 0.10             | Passed  |
| First Order  | 324.45           | 324.74      | 325.15           | Passed  |
| Second Order | 649.23           | 649.56      | 649.97           | Passed  |

---

## Wavelength Repeatability:

|                               |                            |
|-------------------------------|----------------------------|
| <b>Lamp Used:</b> Copper      | <b>Lamp Current(mA):</b> 4 |
| <b>Peak Used(nm):</b> 324.750 | <b>Slit Width(nm):</b> 0.2 |
| <b>Connected to Socket:</b> 3 | <b>Slit Height:</b> Normal |

**Lamp Alignment:** Performed

**Lower Limit(nm)** 324.759 324.879 **Upper Limit(nm)**

*(Approach from Zero Order)*

*(Approach from end)*

Sample 1: **324.819**

Sample 2: **324.811**

Sample 3: **324.819**

Sample 4: **324.811**

Sample 5: **324.815**

Sample 6: **324.811**

Sample 7: **324.819**

Sample 8: **324.815**

Sample 9: **324.819**

Sample 10: **324.819**

**Mean:** 324.816

**Standard Deviation:** 0.004

**Result:** Passed

---

## Mechanical

### Wavelength Drive:

Passed

### Slit Drive:

Passed

### Turret Drive:

Passed

### Auto Burner Adjuster Drive:

Untested

## Miscellaneous

### Signal Processing Linearity:

Calculate Mode: New Calc Mode

|    | Lower Limit | Actual | Upper Limit | Result: |
|----|-------------|--------|-------------|---------|
| S0 | 114         | 248    | 297         | Passed  |
| S1 | 156         | 165    | 191         | Passed  |
| S2 | 271         | 293    | 332         | Passed  |
| S3 | 474         | 504    | 579         | Passed  |
| S4 | 825         | 904    | 1008        | Passed  |
| S5 | 1435        | 1510   | 1754        | Passed  |
| S6 | 2498        | 2711   | 3053        | Passed  |
| S7 | 4347        | 4658   | 5313        | Passed  |

### Interlocks:

Burner Fitted: Working

Flame Detect: Working

N2O Burner Fitted: Working

GCU Active: Working

Flame Shield Closed: Working

Oxidant Pressure: Working

Gas Control Fitted: Untested

Oxidant Changeover: Working

Pressure Release Bung Fitted: Working

Ignition: Working

Liquid Trap Fitted: Working



---

## Auto Lamp Recognition:

**Lamp 1:** Uncoded Lamp/Not Connected

**Lamp 2:** Uncoded Lamp/Not Connected

**Lamp 3:** 14 - Copper (Cu)

**Lamp 4:** Uncoded Lamp/Not Connected

**Lamp 5:** Not Supported

**Lamp 6:** Not Supported

**Lamp 7:** Not Supported

**Lamp 8:** Not Supported

**Result:** **Passed**

---

## GTA Temperature Monitoring:

**Not Performed**

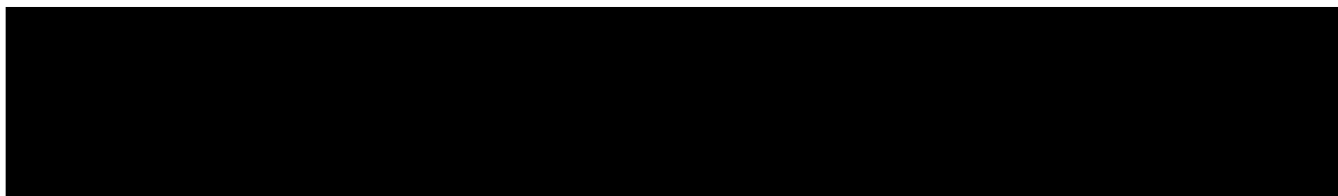
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## Notes:

C2202SU09\_1  
PM 10 Feb 2022

---

## Signatures:







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PREVENTATIVE MAINTENANCE (PM) CHECK LIST

FOR ATOMIC ABSORPTION SPECTROMETER

Model & Serial No. [REDACTED]

Customer : [REDACTED]

Date: 29 ม.ค. 22

Safety

- ☐ Flame, Inspect/replace o-ring nebulizer, spray chamber and burner N/A
- ☐ Flame, Clean nebulizer, spray chamber and burner N/A
- ☐ Flame, Check liquid trap interlock, burner interlock, pressure relief bung interlock and shield interlock N/A
- ☒ Furnace, Clean work head, electrode and shroud
- ☒ Furnace, Clean PSD and PSD tray
- ☒ Furnace, Check water pressure N/A
- ☒ Check drain tube
- ☒ Check exhaust system
- ☒ Check gas pressure sensor interlock
- ☒ Check and all gas hoses for SpectrAA
- ☒ Clean computer control

Optics

- ☒ Inspect/Replace that external optics surfaces
- ☒ Check Wavelength Accuracy the copper line at 323.0-326.0 nm = 324.7 nm
- ☒ Check that PMT % Gain the copper at 324.8 nm, 4 mA, 0.5 nm slit width, Gain = 49% (should be  $\leq 64\%$  or  $\leq 380V$ )
- ☐ Flame, Check D2 lamp is work N/A



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80-82 Prachathipatai Rd., Bangkhunphrom, Pranakorn, Bangkok 10200

Tel. 0-2629-0191-6, 0-2280-1787, Fax. 0-2280-1788, E-mail : thawatt@thaiunique.com, Website : www.thaiunique.com

#### Electronics

- ☒ Check power supply voltage
- ☒ Check cables and connectors
- ☒ Check/Clean all boards in the instrument
- ☒ Furnace, Check camera and align\*\*

\*\*Option for Graphite Zeeman only

#### Mechanisms

- ☐ Flame, Check the burner adjuster
- ☒ Furnace, Check PSD accessories

N/A

#### Analytical performance

- ☒ Clear the sample compartment
- ☐ Flame, Check uptake rate form 7.2-10.6 mL per minute = \_\_\_\_\_ mL/min
- ☒ Test Photometric noise, STDV = 0.0001 Abs (should be  $\leq 0.00050$  Abs)
- ☐ Flame, Test high solids nebulizer setting use

N/A

N/A

-Air/acet Cu 5 ppm = \_\_\_\_\_ Abs, and Precision

(%RSD)= \_\_\_\_\_ % (should be  $> 0.55$  Abs and  $< 0.5\%$  RSD)

or

-N20/Acet Cu 5 ppm = \_\_\_\_\_ Abs, and Precision

(%RSD)= \_\_\_\_\_ % (should be  $> 0.3$  Abs and  $< 0.5\%$  RSD)

- ☒ Furnace, Characteristic mass and sensitivity Cu 25 ppb = 0.22 Abs, and Precision (%RSD)= 2.4 % (should be  $\geq 0.15$  Abs and  $\leq 4.0\%$  RSD)

SIGN :

Engineer

## BSC Certification Test Report

Page 1 of 6

**Certificate No. :** M01075/22

**Customer Name :**

**Customer Address :**

**Equipment :** Biological Safety Cabinet **Class** II **Type** A2

**Manufacturer :** Microtech

**Model :** V6-T

**Serial No. :** 0972

**ID No. :** WWL0084

**Were in accordance with** ☒ EN 12469 ☐ NSF 49 ☐ Manufacturer's specification

**Test Date :** 23/09/2022

**Due Date :** 23/09/2023 *or after HEPA filters are replaced or unit is moved*

**Test by :**

**Approved by :**

**Issued Date :** 26/09/2022

This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).

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**Certificate No. :** M01075/22

**Procedure Used :**

- : European Standard EN12469 : 2000 has the status of British Standard, Biotechnology Performance criteria for microbiological safety cabinets.
- : NSF International Standard / American National Standard NSF / ANSI 49-2008 Biosafety Cabinet : Design, Construction, Performance and Field Certification.
- : Australian Standard : AS 1807.23-2000 Determination of intensity of radiation from germicidal ultraviolet lamps.
- : Manufacturer's specification.

**1. Downflow velocity test.**

**Measurement Information**

| No. of Rows | No. of Readings | Grid Spacing<br>Front-Back | Grid Spacing<br>Side-Side | Probe height<br>Above sash |
|-------------|-----------------|----------------------------|---------------------------|----------------------------|
| 2           | 8               | 1/4,3/4                    | 1/8,3/8                   | 100mm                      |

**Measurement Data.**

|      |      |      |      |
|------|------|------|------|
| 0.36 | 0.42 | 0.43 | 0.41 |
| 0.40 | 0.34 | 0.34 | 0.33 |

**Average velocity** 0.38 m/s ( 75 FPM.) **Velocity range** 0.25-0.50 m/s ( 49-98 FPM.)

**Uniformity( EN: +/-20%avg.)** 0.30 - 0.46 m/s ( 60 - 90 FPM.)

**Supply filter dimension** 24 x 72 (inch x inch) **Supply filter area** 10.69 SQ.FT

**Downflow volume (Q)** 802 CFM.

**Result Summary** ☒ **Pass** ☐ **Fail**

**Equipment used :** Thermo Anemometer **Model** 425 **S/N :** 02623979 **Calibration date :** 14/07/2022

Certificate No. : M01075/22

**2. Inflow velocity test.**

Select method. : ☐ DIM ☒ Exhaust velocity. ☐ MFG's Specifications

|      |      |      |      |      |
|------|------|------|------|------|
| 0.53 | 0.47 | 0.48 | 0.50 | 0.51 |
| 0.57 | 0.46 | 0.52 | 0.53 | 0.50 |
| 0.54 | 0.57 | 0.55 | 0.52 | 0.53 |
| 0.53 | 0.51 | 0.57 | 0.54 | 0.51 |
| 0.51 | 0.48 | 0.53 | 0.55 | 0.56 |

Average Inflow velocity 0.44 m/s (86 FPM.) Velocity range ≥0.40 m/s ( ≥79 FPM.)

Inflow dimension 8 x 72 (inch x inch) Inflow area 4.00 SQ.FT

Inflow volume(Q) 344 CFM

Result Summary ☒ Pass ☐ Fail

Adjustments Required ☐ Fan Speed ☐ Damper

Equipment used : Thermo Anemometer Model 425 S/N : 02623979 Calibration date : 14/07/2022

**3. HEPA filter leak test.**

**Measurement Data**

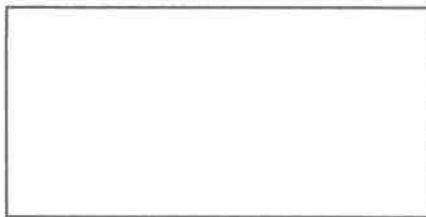
| HEPA Filter         | PAO Upstream Conc.(calculated) | Specification | Measured leak penetration |
|---------------------|--------------------------------|---------------|---------------------------|
| Supply HEPA Filter  | <u>18</u> µg/l.                | <0.003%       | <u>&lt;0.003%</u>         |
| Exhaust HEPA Filter | <u>18</u> µg/l.                | <0.003%       | <u>&lt;0.003%</u>         |

**Certificate No. :** M01075/22

**Leak location**

Supply HEPA Filter

Back



Exhaust HEPA Filter

Back



**Result Summary**

☒ **Pass**

☐ **Fail**

**Equipment used :** Aerosol Photometer **Model** 2I **S/N :** 26468 **Calibration date** 14/07/2022

**Equipment used :** Smoke Generator **Model** TDA-6D **S/N :** 26530

**4. Airflow smoke patterns test**

**Measurement Information**

1. Downflow Pattern test : Smoke shall be passed from one end of the cabinet to the other, along the centerline of the work surface, at a height of 4 inch (10 cm) above the top of the access opening
2. View screen retention test : Smoke shall be passed from one end of the cabinet to the other, 1.0 in (2.5 cm) behind the view screen, at a height 6.0 inch (15 cm) above the top of the access opening.
3. Work opening edge retention test : Smoke shall be passed along the entire perimeter of the work opening  
Particular attention should be paid to corners and vertical edges.
4. Sash/window seal test : Smoke shall be passed up the inside of the window 2 in (5 cm) from the sides and along the top of the work area.



**Certificate No. :** M01075/22

**Result Summary**

|   |   |  |
|---|---|--|
| <b>Downflow Pattern test</b>            | <input checked="" type="checkbox"/> <b>Accept</b> | <input type="checkbox"/> <b>Non-Conforming</b> |
| <b>View screen retention test</b>       | <input checked="" type="checkbox"/> <b>Accept</b> | <input type="checkbox"/> <b>Non-Conforming</b> |
| <b>Work opening edge retention test</b> | <input checked="" type="checkbox"/> <b>Accept</b> | <input type="checkbox"/> <b>Non-Conforming</b> |
| <b>Sash/window seal test</b>            | <input checked="" type="checkbox"/> <b>Accept</b> | <input type="checkbox"/> <b>Non-Conforming</b> |

**5. Site installation**

|                                   |                                      |                                      |  |
|-----------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Sash Alarm.</b>                | <input type="checkbox"/> <b>Pass</b> | <input type="checkbox"/> <b>Fail</b> | <input checked="" type="checkbox"/> <b>N/A</b> |
| <b>Interlock System.</b>          | <input type="checkbox"/> <b>Pass</b> | <input type="checkbox"/> <b>Fail</b> | <input checked="" type="checkbox"/> <b>N/A</b> |
| <b>Exhaust System Performance</b> | <input type="checkbox"/> <b>Pass</b> | <input type="checkbox"/> <b>Fail</b> | <input checked="" type="checkbox"/> <b>N/A</b> |

**Remark / Recommendation**

ระบบ Site installation ไม่มีการตรวจสอบ เนื่องจากตู้ไม่มีฟังก์ชันนี้

**6. Illumination Test (Lighting) : Option**

Lighting should be adequate for safe working within the cabinet. Illumination measured at the work surface.

Lux

|     |      |      |     |
|-----|------|------|-----|
| 620 | 965  | 938  | 561 |
| 867 | 1446 | 1492 | 768 |

**Remark :**

**Certificate No. :** M01075/22

**7. Ultraviolet Lamp Test (UV) : Option**

Ultraviolet radiation where UV Lamp are fitted, the intensity of radiation at a wavelength of 254 nm.

Shall be not less than 400 mW/m<sup>2</sup> when measures at work floor surface.

mW/m<sup>2</sup>

|     |      |      |     |
|-----|------|------|-----|
| 720 | 1510 | 1540 | 760 |
| 470 | 980  | 990  | 450 |

**Remark :**

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