

ประจำเดือนมีนาคม พ.ศ. 2566

# TE-Wilbur Calibration Worksheet

145 South Miami Ave. Cleves, OH 45002 513.467.9000 sales@tisch-env.com

Date / Time: 1/02/22 10 : 20 Serial Number: 299 Technician: NUT

Calibrator Make/Model: BGI Deltacal Due Date: 05/22 S/N: 200042

## AMBIENT TEMPERATURE (°C)

As Found	Calibrator Reading	As Left
<u>37.0</u>	<u>35.2</u>	<u>35.2</u>

## FILTER TEMPERATURE (°C)

As Found	Calibrator Reading	As Left
<u>34.5</u>	<u>36.8</u>	<u>36.9</u>

## BAROMETRIC PRESSURE (mmHg)

As Found	Calibrator Reading	As Left
<u>751.6</u>	<u>752.3</u>	<u>752.2</u>

## FLOW CALIBRATION (Liters Per Minute)

	As Found		Calibrator Reading	As Left	
Slope:	<u>0.931</u>	1	<u>15.02</u>	<u>14.85</u>	<u>15.03</u>
Intercept:	<u>1.294</u>	2	<u>15.93</u>	<u>15.87</u>	<u>15.84</u>
R factor:	<u>0.99926</u>	3	<u>16.96</u>	<u>16.86</u>	<u>16.67</u>
		4	<u>18.91</u>	<u>19.00</u>	<u>18.34</u>
Calibration Verification:			<u>Setpoint</u> <u>16.67</u>	<u>As Found</u> <u>16.67</u>	

## LEAK CHECK RESULTS

Leak Check Start Pressure: 234.8 (inches of H<sub>2</sub>O)  
 Leak Check Fail Pressure: 184.8 (inches of H<sub>2</sub>O)  
 Leak Check End Pressure: 225.1 (inches of H<sub>2</sub>O)

Leak Check Pass / Fail

Pass ☒

Fail ☐

Technician: NUT Date: 1/02/2022

# ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์ Blue Consultant Limited Partnership

32/751 ถนนประชาอุทิศ แขวงทุ่งครุ เขตทุ่งครุ กรุงเทพฯ 10140

โทร.0-2873-6045-6 โทรสาร 0-2873-6046

ห้องปฏิบัติการวิเคราะห์เอกซเรย์ไอออนูญาตลงวันที่ 14 สิงหาคม 2563

## CALIBRATION REPORT

Instrument : BGI PQ200 Air Sampler

Manufacturer : BGI

Model : PQ200

Date of Calibrate : November 25, 2022

Calibrator : Volumetric Air Flow Calibrator

Manufacturer : Mesa Labs

Model: DeltaCal DC1

Serial No. : 170517

Environment : Temperature 32.1°C

Humidity 36%RH

Barometric Pressure 757 mmHg

### Calibration Report

No.	Serial No.	Standard Setting (LPM)	Instrument Reading (LPM)	Inspection Result
2	71011	16.67	16.70	Pass

ในนามห้องปฏิบัติการห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์



(นางสาวนิดดา อนันต์สุวรรณชัย)

ผู้จัดการห้องปฏิบัติการ

ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์  
Blue Consultant  
Limited Partnership

ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์ Blue Consultant Limited Partnership

32/751 ถนนประชาอุทิศ แขวงทุ่งครุ เขตทุ่งครุ กรุงเทพฯ 10140

โทร.0-2873-6045-6 โทรสาร 0-2873-6046

ห้องปฏิบัติการวิเคราะห์เอกซเรย์อนุญาตลงวันที่ 14 สิงหาคม 2563

CALIBRATION REPORT

Equipment : SO<sub>2</sub> Analyzer

Serial No. : 233, 430

Brand/Model: API/100A, Teledyne-API/T100

Date of Calibrate : November 25, 2022

Reference Standard

Certification Date: October 29, 2019

Component: SO<sub>2</sub>: 55.62 ppm , NO: 57.21 ppm , CO : 4,551 ppm

Cylinder No.: EB0128767

Expiry Date: October 29, 2027

Calibration Check ( Before adjust )

Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
233	0.2	0	0.2	401.0	400	1.0
430	0.3	0	0.3	400.6	400	0.6

Calibration Check ( After adjust )

Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
233	0	0	0	400	400	0
430	0	0	0	400	400	0

ในนามห้องปฏิบัติการห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์



(นางสาวนิดดา อนันต์สุวรรณชัย)

ผู้จัดการห้องปฏิบัติการ

ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์ **Blue Consultant Limited Partnership**

32/751 ถนนประชาอุทิศ แขวงทุ่งครุ เขตทุ่งครุ กรุงเทพฯ 10140

โทร.0-2873-6045-6 โทรสาร 0-2873-6046

ห้องปฏิบัติการวิเคราะห์เอกชนใบอนุญาตลงวันที่ 14 สิงหาคม 2563

**CALIBRATION REPORT**

**Equipment :** SO<sub>2</sub> Analyzer

**Serial No. :** 2712, 3569

**Brand/Model:** Teledyne-API/T100

**Date of Calibrate :** August 30, 2022

**Reference Standard**

**Certification Date:** October 29, 2019

**Component:** SO<sub>2</sub>: 55.62 ppm , NO: 57.21 ppm , CO : 4,551 ppm

**Cylinder No.:** EB0128767

**Expiry Date:** October 29, 2027

**Calibration Check ( Before adjust )**

Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
2712	-0.1	0	-0.1	398.9	400	-1.1
3569	0.2	0	0.2	400.2	400	0.2

**Calibration Check ( After adjust )**

Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
2712	0	0	0	400	400	0
3569	0	0	0	400	400	0

ในนามห้องปฏิบัติการห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์



(นางสาวนิดดา อนันต์สุวรรณชัย)

ผู้จัดการห้องปฏิบัติการ

ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์ Blue Consultant Limited Partnership

32/751 ถนนประชาอุทิศ แขวงทุ่งครุ เขตทุ่งครุ กรุงเทพฯ 10140

โทร.0-2873-6045-6 โทรสาร 0-2873-6046

ห้องปฏิบัติการวิเคราะห์เอกซเรย์ไอออนบวกตั้งแต่วันที่ 14 สิงหาคม 2563

CALIBRATION REPORT

Equipment : NOx Analyzer

Serial No. : 3205, 17C-68152-359

Brand/Model:Teledyne-API/T200, Thermo/42C

Date of Calibrate : August 30, 2022

Reference Standard

Certification Date: October 29, 2019

Component: SO2: 55.62 ppm , NO: 57.21 ppm , CO : 4,551 ppm

Cylinder No.: EB0128767

Expiry Date: October 29, 2027

Calibration Check ( Before adjust )

Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx
3205	3.9/1.4/5.3	0/0/0	3.9/1.4/5.3	398.2/3.2/401.4	400/0/400	-1.8/3.2/1.4
17C-68152-359	4.5/1.2/5.7	0/0/0	4.5/1.2/5.7	404.0/3.9/407.9	400/0/400	4.0/3.9/7.9

Calibration Check ( After adjust )

Serial No.	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)
	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx	NO/NO2/NOx
3205	0/0/0	0/0/0	0/0/0	400/0/400	400/0/400	0/0/0
17C-68152-359	0/0/0	0/0/0	0/0/0	400/0/400	400/0/400	0/0/0

ในนามห้องปฏิบัติการห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์



(นางสาวนิดดา อนันต์สุวรรณชัย)

ผู้จัดการห้องปฏิบัติการ

ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์  
Blue Consultant  
Limited Partnership



## Certificate of Calibration

Certificate Number : SPR22060406-1

Page : 1 of 3

Customer : MONITORING AND ACCESSORY ENVIRONMENTAL CO., LTD.  
142, Soi Kalapapruek 6, Bang Wa Sub-district, Phasicharoen District,  
Bangkok 10160

Equipment Name : Sound Calibrator

Manufacturer : Tenmars

Model : TM-100

Serial Number : 190301467

ID. Number : N/A

### Environmental Conditions

Ambient Temperature :  $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$

Received Date : 24 Jun 2022

Relative Humidity :  $50\% \pm 15\%$

Calibration Date : 09 Jul 2022

Location of Calibration : In-Lab

Recommend Due Date : 09 Jul 2023

Calibration Procedure : In-House Method

Date of Issue : 10 Jul 2022

### Method of Calibration

This certifies that the above instrument was calibrated in compliance with the calibration system requirement of ISO/IEC 17025:2017 in accordance with reference procedure. Standards used to perform this calibration are certified by to NIST or equivalent, National metrology institute, Natural physical constants, consensus standards. The result reported herein apply only to the calibration of the item described above as received. Our decision rule is to contact the customer if the item pass and fail calibration when the results include the uncertainties and the customer must determine if the results meets their needs.

All calibrations are performed within manufacture's specifications. The calibration certificate shall not be reproduced except in full, without written approval of SP Metrology System (Thailand).

Calibrated by : Mr.Chumpon Dokpikul

Calibration Officer

Approved by :

( Mr.Worapong Sinthusopa )

Authorized Signatory



## Calibration Report

Certificate Number : SPR22060406-1

Page : 2 of 3

### Reference Standards

Equipment Name	Model	Serial No.	Certificate No.	Due. Date
Measuring Receiver	8902A	2950A02471	EF-0005-22	01 Feb 2023
AUDIO Analyzer	8903B	3011A09975	EL05615/22	22 Feb 2023

### Traceability

This certification is traceable to the International System of Unit maintained at :  
NIMT - The National Institute of Metrology, Thailand.  
PCAL - Professional Calibration & Services Co.,Ltd





## Result of Calibration

Certificate No. : SPR22060406-1

Page : 3 of 3

Function : Sound Level

UUC Setting ( $\pm$ dB )	Standard Reading ( dB )	Error ( dB )	Uncertainty ( $\pm$ dB )
94	94.04	-0.04	1.5
114	113.95	0.05	1.5

### Note:

The result of calibration was found accurate as show on date and place of calibration only.  
This Certificate is not certified for any commercial transaction.

### Measurement Uncertainty

The 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 -



## Certificate of Calibration

Certificate Number : SPR22030278-2

Page : 1 of 3

Customer : MONITORING AND ACCESSORY ENVIRONMENTAL CO., LTD.  
142, Soi Kalapapruek 6, Bang Wa Sub-district, Phasicharoen District,  
Bangkok 10160

Equipment Name : Sound Level Meter

Manufacturer : ACO

Model : 6236

Serial Number : 122022

ID. Number : N/A

### Environmental Conditions

Ambient Temperature :  $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$

Received Date : 17 Mar 2022

Relative Humidity :  $50\% \pm 15\%$

Calibration Date : 21 Mar 2022

Location of Calibration : In-Lab

Recommend Due Date : 21 Mar 2023

Calibration Procedure : SP-CPE-04-01

Date of Issue : 22 Mar 2022

### Method of Calibration

This certifies that the above instrument was calibrated in compliance with the calibration system requirement of ISO/IEC 17025:2017 in accordance with reference procedure. Standards used to perform this calibration are certified by to NIST or equivalent, National metrology institute, Natural physical constants, consensus standards. The result reported herein apply only to the calibration of the item described above as received. Our decision rule is to contact the customer if the item pass and fail calibration when the results include the uncertainties and the customer must determine if the results meets their needs.

All calibrations are performed within manufacture's specifications. The calibration certificate shall not be reproduced except in full, without written approval of SP Metrology System (Thailand).

Calibrated by : Mr. Surasak Vakjan

Calibration Officer

Approved by :

( Mr. Worapong Sinthusopa )

Authorized Signatory



## Calibration Report

Certificate Number : SPR22030278-2

Page : 2 of 3

### Reference Standards

Equipment Name	Model	Serial No.	Certificate No.	Due. Date
Sound Level Calibrator	SC-942	B014059	EEL.BP. 34/1264	22 Dec 2022

### Traceability

This certification is traceable to the International System of Unit maintained at :  
TISTR - Thailand Institute of Scientific and Technological Research



## Result of Calibration

Certificate No. : SPR22030278-2

Page : 3 of 3

Range : 94 to 114 dB

Function : @1kHz

Select A

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty ( ± )
	Fast	Slow	Fast	Slow	
94	94.0	94.0	0.0	0.0	0.15
114	113.9	113.9	-0.1	-0.1	0.15

Select C

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty ( ± )
	Fast	Slow	Fast	Slow	
94	94.1	94.1	0.1	0.1	0.15
114	114.0	114.0	0.0	0.0	0.15

Select Z

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty ( ± )
	Fast	Slow	Fast	Slow	
94	94.2	94.2	0.2	0.2	0.15
114	114.1	114.1	0.1	0.1	0.15

### Note:

The result of calibration was found accurate as show on date and place of calibration only.  
This Certificate is not certified for any commercial transaction.

### Measurement Uncertainty

The reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2$ , providing a level of confidence approximately 95%.

- End of Certificate -





## Certificate of Calibration

Certificate Number : SPR22020414-2

Page : 1 of 3

Customer : MONITORING AND ACCESSORY ENVIRONMENTAL CO., LTD.

142, Soi Kalapapruek 6, Bang Wa Sub-district, Phasicharoen District,  
Bangkok 10160

Equipment Name : Sound Level Meter

Manufacturer : ACO

Model : 6236

Serial Number : S-08562

ID. Number : N/A

### Environmental Conditions

Ambient Temperature :  $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$

Received Date : 23 Feb 2022

Relative Humidity :  $50\% \pm 15\%$

Calibration Date : 24 Feb 2022

Location of Calibration : In-Lab

Recommend Due Date : 24 Feb 2023

Calibration Procedure : SP-CPE-04-01

Date of Issue : 25 Feb 2022

### Method of Calibration

This certifies that the above instrument was calibrated in compliance with the calibration system requirement of ISO/IEC 17025:2017 in accordance with reference procedure. Standards used to perform this calibration are certified by to NIST or equivalent, National metrology institute, Natural physical constants, consensus standards. The result reported herein apply only to the calibration of the item described above as received. Our decision rule is to contact the customer if the item pass and fail calibration when the results include the uncertainties and the customer must determine if the results meets their needs.

All calibrations are performed within manufacture's specifications. The calibration certificate shall not be reproduced except in full, without written approval of SP Metrology System (Thailand).

Calibrated by : Mr.Chumpon Dokpikul

Calibration Officer

Approved by :

( Mr.Worapong Sinthusopa )

Authorized Signatory



## Calibration Report

Certificate Number : SPR22020414-2

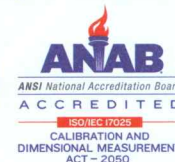
Page : 2 of 3

### Reference Standards

Equipment Name	Model	Serial No.	Certificate No.	Due. Date
Sound Level Calibrator	SC-942	B014059	EEL.BP. 34/1264	22 Dec 2022

### Traceability

This certification is traceable to the International System of Unit maintained at :  
TISTR - Thailand Institute of Scientific and Technological Research



## Result of Calibration

Certificate No. : SPR22020414-2

Page : 3 of 3

Range : 94 to 114 dB

Function : @1kHz

Select A

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty ( ± )
	Fast	Slow	Fast	Slow	
94	94.0	94.0	0.0	0.0	0.15
114	114.0	114.0	0.0	0.0	0.15

Select C

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty ( ± )
	Fast	Slow	Fast	Slow	
94	94.2	94.2	0.2	0.2	0.15
114	114.1	114.1	0.1	0.1	0.15

Select Z

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty ( ± )
	Fast	Slow	Fast	Slow	
94	94.2	94.2	0.2	0.2	0.15
114	114.2	114.2	0.2	0.2	0.15

### Note:

The result of calibration was found accurate as show on date and place of calibration only.  
This Certificate is not certified for any commercial transaction.

### Measurement Uncertainty

The 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 –





**Metrology and Calibration Department**  
**Electrical Maintenance Division**  
**Electricity Generating Authority of Thailand**

81 Moo 11 Bangkruai - Sainoi Rd., Sainoi, Nonthaburi 11150 Tel. (662) 436-8789 Ext. 6155



## Certificate of Calibration

Issued by : Vibration Laboratory

Certificate No. : 22V027

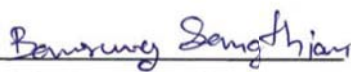
Reference No. : CBLUE01V004

Received Date : 08 March 2022

Calibrated Date : 15 March 2022

Page 1 of 5

Client : ห้างหุ้นส่วนจำกัด บลู คอนซัลแตนท์  
Address : 32/751 ถนนประชาอุทิศ แขวงทุ่งครุ เขตทุ่งครุ กรุงเทพมหานคร 10140  
Equipment : VIBRATION METER  
Manufacture /Brand : INSTANTEL  
Model : Micromate  
Serial No./ ID No. : UM8171

  
( Mr. Bamrung Sangthian )

Authorised Signatory

Issue Date 16 / March 2022

This certificate is issued in accordance with the conditions of accreditation granted by The National Accreditation Council of Thailand which has assessed the measurement capability of the laboratory and its traceability to recognised national standards and to the units of measurement realised at the corresponding national standards laboratory. This certificate may not be reproduced other than in full, except with the prior written approval of the head of calibration services and environmental analysis department.





**Metrology and Calibration Department**  
**Electrical Maintenance Division**  
**Electricity Generating Authority of Thailand**

Continued of Calibration Report

Certificate Number. 22V027

Page 2 of 5

**Standard Used**

The table below is described the calibrator through the International System of Unit.

Description	Manufacture/Model	Serial No.	Traceable No.	Due Date
Conditioning Amplifier Type 2626	Brue! & Kjaer	1242376	AV-0045-20	18 September 2022
Accelerometer Type 8305	Brue! & Kjaer	1262817	AV- 0043-20	02 December 2022
Digital Multimeter /8846A	FLUKE	4330020	21E287	20 September 2022

**Ambient Environment :**

The Calibration was performed in an environment of  $( 23 \pm 2 ) ^{\circ} \text{C}$  and  $( 50 \pm 10 ) \%$  relative humidity.

**Measurement Method :**

The unit under calibration was calibrated by comparison with standard accelerometer. The calibration method is based on WI-MCC-E-301 by comparison with reference accelerometer standard .

**Measurement Results**

The measurement results, labeled in the following pages give the calibration results and associated with measurement uncertainties.

**Measurement Uncertainty**

The Measurement Uncertainty are labeled on the following pages Completed the expanded uncertainty, that was calculated in accordance with the method in M3003, using coverage factor  $k = 2$  . The value of the measured lies within the assigned ranges of values of confidence level of approximately 95%.

**Traceability :**

The measurement is traceable to the International System of Unit through

- The National Institute of Metrology (Thailand)
- Metrology and Calibration Department



**Metrology and Calibration Department**  
**Electrical Maintenance Division**  
**Electricity Generating Authority of Thailand**

Continued of Calibration Report

Certificate Number. 22V027

Page 3 of 5

DESCRIPTION	INSTRUMENT VALUE		UNCERTAINTY
	STANDARD SETTING	UUC READING	
<b>Vertical</b>			
Frequency (Hz)	mm/s <sub>p</sub>	mm/s <sub>p</sub>	± mm/s <sub>p</sub>
* 20	10.00	10.21	0.15
*30	10.00	10.19	0.15
40	10.00	10.18	0.15
80	10.00	10.12	0.15

\* Calibration made "Not TISI Accredited" in this Certificate have been included for completeness.

**Transducer Part :** ENSL 16117

**Condition :** Installation by vertical direction



**Metrology and Calibration Department**  
**Electrical Maintenance Division**  
**Electricity Generating Authority of Thailand**

Continued of Calibration Report

Certificate Number. 22V027

Page 4 of 5

DESCRIPTION	INSTRUMENT VALUE		UNCERTAINTY
	STANDARD SETTING	UUC READING	
<b>Transverse</b>			
Frequency (Hz)	mm/s <sub>p</sub>	mm/s <sub>p</sub>	± mm/s <sub>p</sub>
*20	10.00	10.22	0.15
*30	10.00	10.07	0.15
40	10.00	10.01	0.15
80	10.00	9.90	0.14

\* Calibration made "Not TISI Accredited" in this Certificate have been included for completeness.

**Tranducer Part :** ENSL 16117

**Condition :** Installation by Transverse direction



**Metrology and Calibration Department**  
**Electrical Maintenance Division**  
**Electricity Generating Authority of Thailand**

Continued of Calibration Report

Certificate Number. 22V027

Page 5 of 5

DESCRIPTION	INSTRUMENT VALUE		UNCERTAINTY
	STANDARD SETTING	UUC READING	
<b>Longitude</b>			
Frequency (Hz)	mm/s <sub>p</sub>	mm/s <sub>p</sub>	± mm/s <sub>p</sub>
*20	10.00	10.19	0.15
*30	10.00	10.06	0.15
40	10.00	10.04	0.15
80	10.00	9.99	0.14

\* Calibration made "Not TISI Accredited" in this Certificate have been included for completeness.

**Tranducer Part :** ENSL 16117

**Condition :** Installation by Longitude direction

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



**Metrology and Calibration Department**  
**Electrical Maintenance Division**  
**Electricity Generating Authority of Thailand**

81 Moo 11 Bangkrui - Sainoi Rd., Sainoi, Nonthaburi 11150 Tel. (662) 436-8789 Ext. 6155



## Certificate of Calibration

Issued by : Vibration Laboratory

Certificate No. : 22V022

Reference No. : CBLUE01V008

Received Date : 08 March 2022

Calibrated Date : 16 March 2022

Page 1 of 5

Client : ห้างหุ้นส่วนจำกัด บอ คอนซัลแตนท์  
Address : 32/751 ถนนประชาอุทิศ แขวงทุ่งครุ เขตทุ่งครุ กรุงเทพมหานคร 10140  
Equipment : VIBRATION METER  
Manufacture /Brand : INSTANTEL  
Model : Micromate  
Serial No./ ID No. : UM8882

Bamrung Sangthian  
( Mr. Bamrung Sangthian )

Authorised Signatory

Issue Date 16 / March / 2022

This certificate is issued in accordance with the conditions of accreditation granted by The National Accreditation Council of Thailand which has assessed the measurement capability of the laboratory and its traceability to recognised national standards and to the units of measurement realised at the corresponding national standards laboratory. This certificate may not be reproduced other than in full, except with the prior written approval of the head of calibration services and environmental analysis department.





**Metrology and Calibration Department**  
**Electrical Maintenance Division**  
**Electricity Generating Authority of Thailand**

Continued of Calibration Report

Certificate Number. 22V022

Page 2 of 5

**Standard Used**

The table below is described the calibrator through the International System of Unit.

Description	Manufacture/Model	Serial No.	Traceable No.	Due Date
Conditioning Amplifier Type 2626	Bruel & Kjaer	1242376	AV-0045-20	18 September 2022
Accelerometer Type 8305	Bruel & Kjaer	1262817	AV- 0043-20	02 December 2022
Digital Multimeter /8846A	FLUKE	4330020	21E287	20 September 2022

**Ambient Environment :**

The Calibration was performed in an environment of  $(23 \pm 2) ^\circ \text{C}$  and  $(50 \pm 10) \%$  relative humidity.

**Measurement Method :**

The unit under calibration was calibrated by comparison with standard accelerometer. The calibration method is based on WI-MCC-E-301 by comparison with reference accelerometer standard .

**Measurement Results**

The measurement results, labeled in the following pages give the calibration results and associated with measurement uncertainties.

**Measurement Uncertainty**

The Measurement Uncertainty are labeled on the following pages Completed the expanded uncertainty, that was calculated in accordance with the method in M3003, using coverage factor  $k = 2$  . The value of the measured lies within the assigned ranges of values of confidence level of approximately 95%.

**Traceability :**

The measurement is traceable to the International System of Unit through

- The National Institute of Metrology (Thailand)
- Metrology and Calibration Department



**Metrology and Calibration Department**  
**Electrical Maintenance Division**  
**Electricity Generating Authority of Thailand**

Continued of Calibration Report

Certificate Number.

22V022

Page 3 of 5

DESCRIPTION	INSTRUMENT VALUE		UNCERTAINTY
	STANDARD SETTING	UUC READING	
<b>Vertical</b>			
Frequency (Hz)	mm/s <sub>p</sub>	mm/s <sub>p</sub>	± mm/s <sub>p</sub>
*20	10.00	10.39	0.15
*30	10.00	10.26	0.15
40	10.00	10.20	0.15
80	10.00	10.11	0.15

\* Calibration made "Not TISI Accredited" in this Certificate have been included for completeness.

**Transducer** Part : ENSL 16119

**Condition** : Installation by vertical direction



**Metrology and Calibration Department**  
**Electrical Maintenance Division**  
**Electricity Generating Authority of Thailand**

Continued of Calibration Report

Certificate Number. 22V022

Page 4 of 5

DESCRIPTION	INSTRUMENT VALUE		UNCERTAINTY
	STANDARD SETTING	UUC READING	
<b>Transverse</b>			
Frequency (Hz)	mm/s <sub>p</sub>	mm/s <sub>p</sub>	± mm/s <sub>p</sub>
*20	10.00	10.31	0.15
*30	10.00	10.10	0.15
40	10.00	10.03	0.15
80	10.00	9.94	0.14

\* Calibration made "Not TISI Accredited" in this Certificate have been included for completeness.

**Tranducer Part :** ENSL 16119

**Condition :** Installation by Transverse direction





**Metrology and Calibration Department**  
**Electrical Maintenance Division**  
**Electricity Generating Authority of Thailand**

Continued of Calibration Report

Certificate Number. 22V022

Page 5 of 5

DESCRIPTION	INSTRUMENT VALUE		UNCERTAINTY
	STANDARD SETTING	UUC READING	
<b>Longitude</b>			
Frequency (Hz)	mm/s <sub>p</sub>	mm/s <sub>p</sub>	± mm/s <sub>p</sub>
*20	10.00	10.36	0.15
*30	10.00	10.17	0.15
40	10.00	10.10	0.15
80	10.00	10.00	0.14

\* Calibration maked "Not TISI Accredited" in this Certificate have been included for completeness.

**Tranducer** Part : ENSL 16119

**Condition** : Installation by Longitude direction

\* End Certificate of Calibration \*