

Site and Calibration Information

Location : TNP Envirovmemtal	Date : September 15, 2021
Serial : TNP-F-01-TSP	Tech : Mr.Tanawat Ngaowattana

Site Conditions

Barometric Pressure (mmHg) : 754	Corrected Pressure (mmHg) : 754
Temperature (deg C) : 33	Temperature (deg K) : 306
Average Press.(mmHg) : 754	Corrected Average (mmHg) : 754
Average Temp.(deg C) : 33	Average Temp.(deg K) : 306

Calibration Orifice

Make : Tish Environment	Qstd Slope : 1.62970
Model : TE-5028A	Qstd Intercept : 0.00443
Serial : 3945	Date Certified : July 29, 2021

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (Chart)	IC (Corrected)	Linear Regression Slope : 28.3339 Intercept : 6.0287 Corr. Coeff : 0.9999 # of Observation : 5
1	7.25	1.620	53.0	52.06	
2	5.85	1.455	48.0	47.15	
3	4.55	1.283	43.0	42.24	
4	3.35	1.100	38.0	37.33	
5	2.40	0.931	33.0	32.42	

Calibrate By :



(Mr.Tanawat Ngaowattana)

Approved By :



(Mr.Nuttachai Triprawat)

Site and Calibration Information

Location : TNP Envirovmemtal	Date : September 15, 2021
Serial : TNP-F-02-TSP	Tech : Mr.Tanawat Ngaowattana

Site Conditions

Barometric Pressure (mmHg) : 756	Corrected Pressure (mmHg) : 756
Temperature (deg C) : 32	Temperature (deg K) : 305
Average Press.(mmHg) : 756	Corrected Average (mmHg) : 756
Average Temp.(deg C) : 32	Average Temp.(deg K) : 305


Calibration Orifice

Make : Tish Environment	Qstd Slope : 1.62970
Model : TE-5028A	Qstd Intercept : 0.00443
Serial : 3945	Date Certified : July 29, 2021

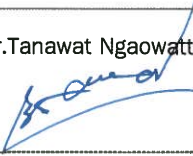
Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (Chart)	IC (Corrected)	Linear Regression Slope : 31.2021 Intercept : 1.8583 Corr. Coeff : 0.9995 # of Observatio : 5
1	7.15	1.165	53.0	52.25	
2	5.75	1.448	48.0	47.32	
3	4.50	1.281	42.0	41.41	
4	3.20	1.079	36.0	35.49	
5	2.30	0.915	31.0	30.56	

Calibrate By :


(Mr.Tanawat Ngaowattana)

Approved By :


(Mr.Nuttachai Triprawat)

Site and Calibration Information


Site		Calibration Orifice	
Location	: TNP Environment Co.,Ltd.	Make	: Tish Environmental
Date	: September 15, 2021	Model	: TE-5028A
Tech	: Mr.Tanawat Ngaowattana	Serial	: 3945
Serial	: TNP-F-01-PM10	Qa Slope (m)	: 1.02049
VFC G-Factor	: 0.09070202	Qa Int (b)	: 0.00279
		Calibrate Due Date	: July 29, 2021

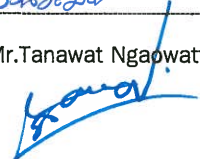
Ambient Conditions

Temp (deg F)	: 86.0		
Ta (deg K)	: 303	Barometric Pressure (In Hg)	: 29.8
Ta (deg C)	: 30.0	Pa (mm Hg)	: 756.9

Ambient Conditions

Run Number	Orifice "H2O	Qa M3/min	Sampler "H2O	Pf mm Hg	Po/Pa	Calculated m3/min	% of Diff
1	4.20	1.268	4.20	7.838	0.990	1.306	3.08
2	4.15	1.260	5.30	9.891	0.987	1.303	3.33
3	4.15	1.260	6.10	11.384	0.985	1.300	3.17
4	4.15	1.260	6.50	12.131	0.984	1.299	3.02
5	4.10	1.253	7.50	13.997	0.982	1.295	3.35

Calibrate By : 
(Mr.Tanawat Ngaowattana)

Approved By : 
(Mr.Nuttachai Triprawat)

Site and Calibration Information

Site		Calibration Orifice	
Location	: TNP Environment Co.,Ltd.	Make	: Tish Environmental
Date	: September 15, 2021	Model	: TE-5028A
Tech	: Mr.Tanawat Ngaowattana	Serial	: 3945
Serial	: TNP-F-04-PM10	Qa Slope (m)	: 1.02049
VFC G-Factor	: 0.09070202	Qa Int (b)	: 0.00279
		Calibrate Due Date	: July 29, 2021

Ambient Conditions

Temp (deg F)	: 85.5		
Ta (deg K)	: 303	Barometric Pressure (in Hg)	: 29.7
Ta (deg C)	: 29.7	Pa (mm Hg)	: 754.4

Ambient Conditions

Run	Orifice	Qa	Sampler	Pf		Calculated	% of
Number	"H2O	M3/min	"H2O	mm Hg	Po/Pa	m3/min	Diff
1	4.20	1.269	3.00	5.599	0.993	1.310	3.23
2	4.20	1.269	3.50	6.532	0.991	1.308	3.07
3	4.15	1.262	4.20	7.838	0.990	1.306	3.49
4	4.10	1.254	5.40	10.078	0.987	1.302	3.83
5	4.00	1.239	9.80	18.289	0.976	1.287	3.87



บริษัท เอ็นไวร์ เซอร์วิส จำกัด

42 รามอินทรา 14 ยอก 9 แขวงจันทบุรี เขตบางเขน กรุงเทพมหานคร 10230 โทรศัพท์ 02-9435814-5 โทรสาร 02-9438201
 บริษัท เอ็นไวร์ เซอร์วิส จำกัด
 ENVIR SERVICE CO., LTD. 42 Ramintra 14 yeak 9, Tha Rang, Bangkhen, Bangkok 10230 Tel : 02-9435814-5 Fax : 02-9438201

Analyzer Performance Test

Calibrated Date: 17 August 2021

Instruments Information

Analyzer Type: CO Analyzer Model: 48C	Manufacturer Thermo Environmental S/N: 48CHL-67713-358
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Calibration System

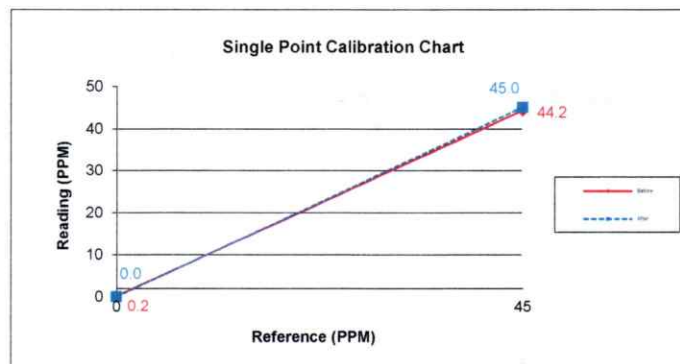
Calibrator Unit	Standard Gas
Dilutor Model Dasibi Model 5008 S/N: 705 ZERO AIR Generator API MODEL 701 S/N: 1924	NO Conc 55.47 PPM SO2 Conc 55.11 PPM CO Conc 4,535 PPM Cylinder number EB0129027 Expire Date: 29 Oct. 2027

Environment: Temperature 25.5 °C

Humidity: 51 %RH

Calibration Report

Status	Zero			Span		
	Reference (PPM)	Reading (PPM)	Drift (PPM)	Reference (PPM)	Reading (PPM)	Drift%
Before	0.0	0.2	0.2	45.0	44.2	-1.7
After	0.0	0.0	0.0	45.0	45.0	0.0



Calibrate By:

Mr. PASAGORN SAMOL





บริษัท เอ็นไวร์ เซอร์วิส จำกัด
ENVIR SERVICE CO., LTD.

บริษัท เอ็นไวร์ เซอร์วิส จำกัด

42 รามอินทรา 14 แยก 9 แขวงท่าแร้ง เขตบางเขน กรุงเทพฯ 10230 โทรศัพท์ 02-9435814-5 โทรสาร 02-9438201

42 Raminthra 14 yeak 9, Tha Rang, Bangkhen, Bankok 10230 Tel : 02-9435814-5 Fax : 02-9438201

Analyzer Performance Test

Calibrated Date: 06 August 2021

Instruments Information

Analyzer Type: NO/NO ₂ /NO _x Analyzer Model: 42C	Manufacturer Thermo Environmental S/N: 0413406269
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Calibration System

Calibrator Unit	Standard Gas
Dilutor Model Dasibi Model 5008 S/N: 705 ZERO AIR Generator API Model 701 S/N: 1924	NO Conc 55.47 PPM SO ₂ Conc 55.11 PPM CO Conc 4,535 PPM Cylinder number EB0129027 Expire Date: 29 Oct. 2027

Environment: Temperature 25.5 °C

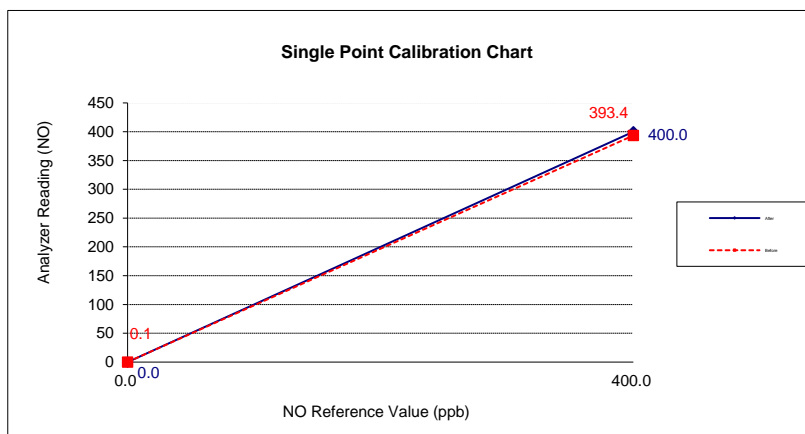
Humidity: 51 %RH

Calibration Check (Before adjust)

GAS	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift%
NO	0.1	0.0	0.1	393.4	400.0	-1.7
NO _x	0.1	0.0	0.1	397.3	400.0	-0.7

Calibration Check (After adjust)

GAS	Zero			Span		
	Reading Value (ppb)	Expected Value (ppb)	Drift (ppb)	Reading Value (ppb)	Expected Value (ppb)	Drift%
NO	0.0	0.0	0.0	400.0	400.0	0.0
NO _x	0.0	0.0	0.0	400.0	400.0	0.0



Calibrate By : Mr. Pasagorn Samol



บริษัท เอ็นไวร์ เซอร์วิส จำกัด

บริษัท เอ็นไวร์ เซอร์วิส จำกัด
ENVIR SERVICE CO., LTD.

42 รามอินทรา 14 แยก 9 แขวงท่าแร้ง เขตบางเขน กรุงเทพฯ 10230 โทรศัพท์ 02-9435814-5 โทรสาร 02-9438201

42 Raminthra 14 yeak 9, Tha Rang, Bangkhen, Bankok 10230 Tel : 02-9435814-5 Fax : 02-9438201

Analyzer Performance Test

Calibrated Date: 07 August 2021

Instruments Information

Analyzer Type: SO2 Analyzer Model: 43C	Manufacturer Thermo Environmental S/N: 0327402325
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Calibration System

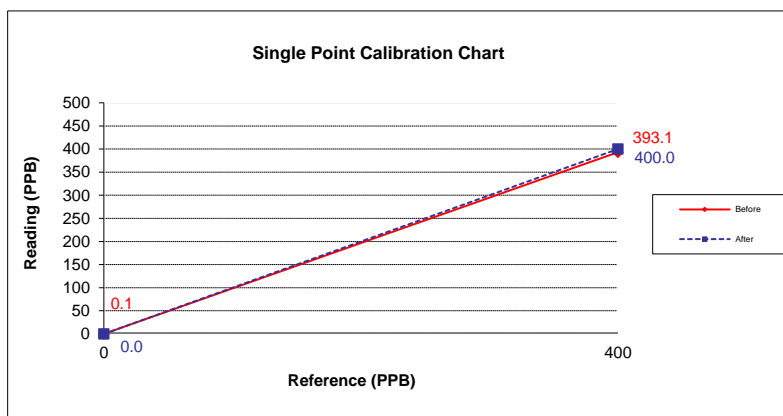
Calibrator Unit	Standard Gas
Dilutor Model Dasibi Model 5008 S/N: 705 ZERO AIR Generator API MODEL 701 S/N: 1924	NO Conc 55.47 PPM SO2 Conc 55.11 PPM CO Conc 4,535 PPM Cylinder number EB0129027 Expire Date: 29 Oct. 2027

Environment: Temperature 25.5 °C

Humidity: 51 %RH

Calibration Report

Status	Zero			Span		
	Reference (PPB)	Reading (PPB)	Drift (PPB)	Reference (PPB)	Reading (PPB)	Drift%
Before	0.0	0.1	0.1	400.0	393.1	-1.7
After	0.0	0.0	0.0	400.0	400.0	0.0



Calibrate By :

Mr.PASAGORN SAMOL



Certificate of Calibration

Certificate Number : SPR21070118-1

Page : 1 of 3

Customer : TNP ENVIRONMENT CO.,LTD.

332/173 Moo.3, Bang Rak Phatthana, Bang Bua Thong, Nonthaburi
11110

Equipment Name : Sound Level Meter

Manufacturer : ACO

Model : 6226

Serial Number : 170131

ID. Number : TNP-F-S01

Environmental Conditions

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

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

Location of Calibration : In-Lab

Calibration Procedure : SP-CPE-04-01

Received Date : 08 Jul 2021

Calibration Date : 09 Jul 2021

Recommend Due Date : 09 Jul 2022

Date of Issue : 10 Jul 2021

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 : SPR21070118-1

Page : 2 of 3

Reference Standards

Equipment Name	Model	Serial No.	Certificate No.	Due. Date
Sound Level Calibrator	SC-942	B014059	EEL.BP.19/1063	15 Oct 2021

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. : SPR21070118-1

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	113.8	113.8	-0.2	-0.2	0.15

Select C

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	94.0	94.0	0.0	0.0	0.15
114	113.8	113.8	-0.2	-0.2	0.15

Select F

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	94.1	94.1	0.1	0.1	0.15
114	113.8	113.8	-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 -



Certificate of Calibration

Certificate Number : SPR21070118-3

Page : 1 of 3

Customer : TNP ENVIRONMENT CO.,LTD.

332/173 Moo.3, Bang Rak Phatthana, Bang Bua Thong, Nonthaburi
11110

Equipment Name : Sound Level Meter

Manufacturer : ACO

Model : 6226

Serial Number : 170116

ID. Number : TNP-F-S03

Environmental Conditions

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

Received Date : 08 Jul 2021

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

Calibration Date : 09 Jul 2021

Location of Calibration : In-Lab

Recommend Due Date : 09 Jul 2022

Calibration Procedure : SP-CPE-04-01

Date of Issue : 10 Jul 2021

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



Result of Calibration

Certificate No. : SPR21070118-3

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	113.8	113.8	-0.2	-0.2	0.15

Select C

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	94.0	94.0	0.0	0.0	0.15
114	113.8	113.8	-0.2	-0.2	0.15

Select F

Unit : dB

Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	94.1	94.1	0.1	0.1	0.15
114	113.8	113.8	-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 -



Calibration Report

Certificate Number : SPR21070118-3

Page : 2 of 3

Reference Standards

Equipment Name	Model	Serial No.	Certificate No.	Due. Date
Sound Level Calibrator	SC-942	B014059	EEL.BP.19/1063	15 Oct 2021

Traceability

This certification is traceable to the International System of Unit maintained at :

TISTR - Thailand Institute of Scientific and Technological Research

Calibration Certificate

Part Number: 721A2601

Description: Micromate with DIN Geophone

Serial Number: UM19128

Calibration Date: NOV 30 2021

Calibration Reference Equipment: 714J7402

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By: _____

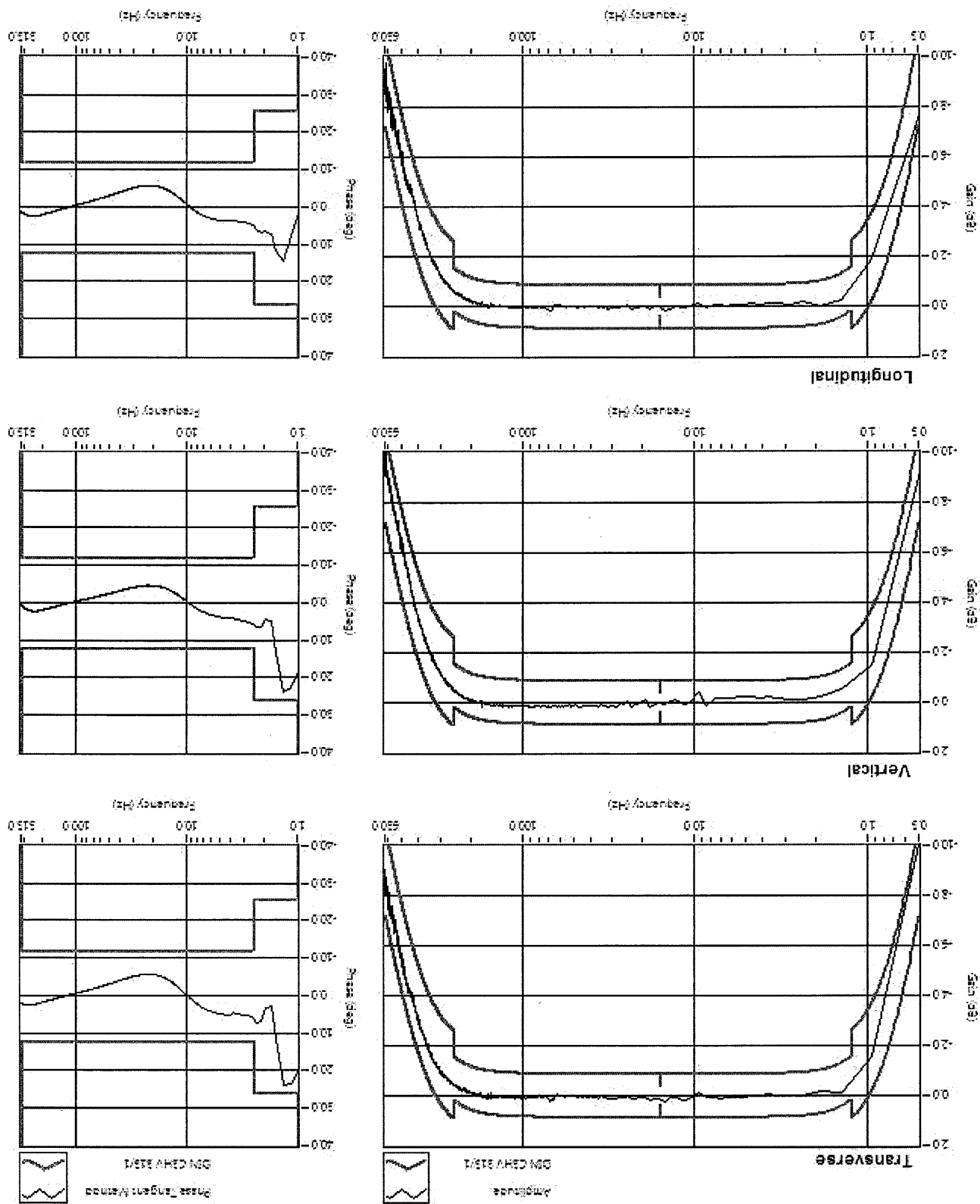
Xiaoming Yang



Instantel®

309 Legget Drive, Ottawa, Ontario, K2K 3A3, (613) 592-4642

Frequency Response of UM19128



Calibration Certificate

Part Number: 721A0201

Description: Micromate ISEE Linear Microphone

Serial Number: UL5389

Calibration Date: NOV 30 2021

Calibration Reference Equipment: 714J7402

The equipment identified above meet or exceeds the International Society of Explosives Engineers (ISEE) 2017 Performance Specification for Blasting Seismographs.

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By: _____

Ninh Nguyen



309 Legget Drive, Ottawa, Ontario, K2K 3A3, (613) 592-4642

Amplitude Frequency Response of UL5389

