

33624 Certificate No.

Page

4 Pages

Customer: Lam Geotechnics Limited

Address: 11/F, Centre Point, 181-185 Gloucester Road, Wanchai, Hong Kong.

Order No.: Q31494

Date of receipt

30-May-13

Item Tested

Description : Digital Sound Level Meter

Manufacturer: B&K

Model

: Type 2236

Serial No.

: 2100736

**Test Conditions** 

Date of Test:

3-Jun-13

Supply Voltage : --

Ambient Temperature :

 $(23 \pm 3)^{\circ}C$ 

Relative Humidity: (50 ± 25) %

**Test Specifications** 

Calibration check.

Ref. Document/Procedure: Z01.

**Test Results** 

All results were within the IEC 651 Type 1, IEC 804 Type 1 & IEC 1260 Class 1 specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No. Description

Cert. No.

Traceable to

S017

Multi-Function Generator

C127181

SCL-HKSAR

S024

Sound Level Calibrator

30620

NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

Calibrated by

Liam Wong

3-Jun-13

Date:

This Certificate is issued by:

Hong Kong Calibration Ltd.

Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.

Tel: 2425 8801 Fax: 2425 8646

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Certificate No. 33624

Page 2 of 4 Pages

#### Results:

## 1. SPL Accuracy

	J	JUT Setting			
Range	Parameter	Frequency Wt.	Freq. Response	Applied Value (dB)	UUT Reading (dB)
20 - 100	SPL	dBA	F	94.0	93.8
			S		93.8
		dBC	F		93.8
		dBL	F		93.9
		1 kHz	F		93.8
40 - 120	SPL	dBA	F	94.0	93.9
		1 kHz	F		93.9
	SPL	dBA	F	114.0	113.8
			S		113.8
		dBC	F		113.9
		dBL F	F		113.9
		1 kHz	F		113.8

IEC 651 Type 1 Spec. : ± 0.7 dB

Uncertainty: ± 0.1 dB

2. Level Stability: 0.0 dB

IEC 651 Type 1 Spec. :  $\pm$  0.3 dB

Uncertainty: ± 0.1 dB

## 3. Linearity

## 3.1 Level Linearity

UUT Range	Applied	UUT Reading	Variation	IEC 651 Type 1 Spec.
(dB)	Value (dB)	(dB)	(dB)	(Primary Indicator Range)
140	114.0	113.9	0.0	± 0.7 dB
130	104.0	103.9	0.0	
120	94.0	93.9 (Ref.)	Care Ann	
110	84.0	83.9	0.0	
100	74.0	73.9	0.0	
100	64.0	63.9	0.0	
100	54.0	53.9	0.0	

Uncertainty:  $\pm 0.1 \text{ dB}$ 



Certificate No. 33624

Page 3 of 4 Pages

## 3.2 Differential level linearity

UUT Range	Applied	UUT Reading		
(dB)	Value (dB)	(dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	83.9	0.0	± 0.4 dB
	94.0	93.9 (Ref.)	- :=:	
	95.0	94.9	0.0	± 0.2 dB

Uncertainty: ± 0.1 dB

## 4. Frequency Weighting

A weighting

Frequen	су	Attenuation (dl	B)	IEC 651 Type 1 Spec.
31.5 H	[z	-39.6		$-39.4 \text{ dB}, \pm 1.5 \text{ dB}$
63 H	[z	-26.4		- 26.2 dB, ± 1.5 dB
125 F	[z	-16.3		- 16.1 dB, ± 1 dB
250 H	[z	-8.8		- 8.6 dB, ± 1 dB
500 F	Iz	-3.3		- $3.2  dB, \pm 1  dB$
1 kF	Iz	0.0	(Ref)	$0 \text{ dB}, \pm 1 \text{ dB}$
2 kH	Iz	+1.2		+ 1.2 dB, ± 1 dB
4 kF	Iz	+0.9		+ 1.0 dB, ± 1 dB
8 kF	Iz	-1.2		- 1.1 dB, + 1.5 dB ~ -3 dB
16 kF	Iz	-6.8		- 6.6 dB, $+ 3$ dB $\sim - \infty$

Uncertainty: ± 0.1 dB

## 5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	
1/10	40.0	39.9	± 0.5 dB
$1/10^2$	40.0	39.8	
$1/10^{3}$	40.0	39.7	± 1.0 dB
1/104	40.0	39.5	

Uncertainty:  $\pm 0.1 \text{ dB}$ 



Certificate No. 33624

Page 4 of 4 Pages

## 6. Filter Response

Filter	Setting	Attenuation (dB)	IEC 1260 Class 1 Spec.
125	Hz	-63.6	<- 61
250	Hz	-44.8	< - 42
500	Hz	-21.0	< - 17.5
707	Hz	-3.7	- 2 ~ - 5
1	kHz (Ref.)	0.0 (Ref.)	
1.41	4 kHz	-4.1	- 2 ~ - 5
2	kHz	-21.4	< - 17.5
4	kHz	-45.0	< - 42
8	kHz	-63.9	<- 61

Uncertainty: ± 0.2 dB

Remark: 1. UUT: Unit-Under-Test

- 2. The uncertainty claimed is for a confidence probability of not less than 95%.
- 3. Atmospheric Pressure: 996 hPa
- 4. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.

----- END -----



Certificate No.

34228

Page

1 of 2 Pages

Customer: Lam Geotechnics Limited

Address: 11/F, Centre Point, 181-185 Gloucester Road, Wanchai, Hong Kong.

Order No.: Q31610

Date of receipt

21-Jun-13

### **Item Tested**

**Description**: Sound Level Calibrator

Manufacturer: Rion

Model

: NC-73

Serial No.

: 10707358

## **Test Conditions**

Date of Test: 25-Jun-13

 $(23 \pm 3)^{\circ}C$ 

Supply Voltage : --

Relative Humidity: (50 ± 25) %

## **Test Specifications**

Ambient Temperature :

Calibration check.

Ref. Document/Procedure: F21, Z02.

### **Test Results**

All results were within the manufacturer's specification.

The results are shown in the attached page(s).

Main Test equipment used:

1110.111			T bla to
Equipment No.	Description Description	Cert. No.	Traceable to
S014	Spectrum Analyzer	30259	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	30620	NIM-PRC & SCL-HKSAR
S041	Universal Counter	28347	SCL-HKSAR
S206	Sound Level Meter	30655	SCL-HKSAR
0200			

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI). The test results apply to the above Unit-Under-Test only

Calibrated by

25-Jun-13

Date:

This Certificate is issued by:

Hong Kong Calibration Ltd.

Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.

Tel: 2425 8801 Fax: 2425 8646

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Certificate No. 34228

Page 2 of 2 Pages

Results:

## 1. Level Accuracy (at 1 kHz)

	1771	Mfr's Spec.
UUT Nominal Value	Measured Value	
475	93.88 dB	$\pm 1 \text{ dB}$
94 dB	35.00	

Uncertainty: ± 0.2 dB

## 2. Frequency Accuracy

UUT Nominal Value	Measured Value	Mfr's Spec.
1 kHz	0.995 kHz	± 2 %

Uncertainty: ± 0.1 %

3. Level Stability: 0.0 dB Uncertainty: ± 0.01 dB

4. Total Harmonic Distortion : < 0.2 %

Mfr's Spec. : < 3 %

Uncertainty: ± 2.3 % of reading

Remark: 1. UUT: Unit-Under-Test

- 2. The uncertainty claimed is for a confidence probability of not less than 95%.
- 3. The above measured values were the mean of 3 measurements.
- 4. Atmospheric Pressure: 999 hPa

----- END -----

## PILOT TESTING LIMTIED

Page 1 / 2

## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Information supplied by customer:

CONTACT: <u>DEREK LO</u>

**WORK ORDER: HK1310015** 

CLIENT: LAM GEOTECHNICS LIMITED

DATE RECEIVED: <u>09/09/2013</u>
DATE OF ISSUE: <u>13/09/2013</u>

ADDRESS: 11/F, CENTRE POINT, 181-185, GLOUCESTER ROAD,

WANCHAI, HONG KONG

### PROJECT: —

### METHOD OF PERFORMANCE CHECK/ CALIBRATION:

Ref: APHA22nd ed 2130B

### **COMMENTS**

It is certified that the item under performance check/calibration has been calibrated/checked by corresponding calibrated equipment in the laboratory.

Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203008
Equipment No.:	
Date of Calibration:	13 September, 2013

#### Remarks:

This is the Final Report. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr. Peter Lee

Director

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Address: Room 1503, 15/F, Wayson Commercial House, 68-70 Lockhart Road, Wanchai, Hong Kong Phone +852 2527 6691 | Email info@pilot-testing.com

**WORK ORDER: HK1310015** 

DATE OF ISSUE: 13th September, 2013

**CLIENT: LAM GEOTECHNICS LIMITED** 

<b>Equipment Type:</b>	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203008
Equipment No.:	
Date of Calibration:	13 September, 2013
Date of next Calibration:	13 December, 2013

### Parameters:

## **Turbidity**

Method Ref: APHA 22<sup>nd</sup> ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.00	0
4	3.85	-3.8
10	10.2	+2.0
40	39.1	-2.2
100	95.0	-5.0
400	420	+5.0
1000	980	-2.0
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.

Mr. Peter Lee

Director

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Information supplied by customer:

CONTACT: <u>DEREK LO</u> WORK ORDER: <u>HK1310017</u>

CLIENT: LAM GEOTECHNICS LIMITED

DATE RECEIVED: <u>09/09/2013</u> DATE OF ISSUE: <u>13/09/2013</u>

ADDRESS: 11/F, CENTRE POINT, 181-185, GLOUCESTER ROAD,

WANCHAI, HONG KONG

#### PROJECT: ---

### METHOD OF PERFORMANCE CHECK/ CALIBRATION:

Ref: APHA22nd ed 2130B

## **COMMENTS**

It is certified that the item under performance check/calibration has been calibrated/checked by corresponding calibrated equipment in the laboratory.

Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203006
Equipment No.:	
Date of Calibration:	13 September, 2013

### Remarks:

This is the Final Report. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr. Peter Lee

Director

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WORK ORDER: HK1310017

DATE OF ISSUE: 13th September, 2013

**CLIENT: LAM GEOTECHNICS LIMITED** 

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1203006
Equipment No.:	
Date of Calibration:	13 September, 2013
Date of next Calibration:	13 December, 2013

### Parameters:

## **Turbidity**

Method Ref: APHA 22<sup>nd</sup> ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.00	0
4	3.85	-3.8
10	9.65	-3.5
40	42.0	+5.0
100	97.2	- 2.8
400	422	+5.5
1000	972	-2.8
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.

Mr. Peter Lee

Director

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Information supplied by customer:

CONTACT: <u>DEREK LO</u> WORK ORDER: <u>HK1310007</u>

CLIENT: LAM GEOTECHNICS LIMITED

DATE RECEIVED: <u>30/07/2013</u> DATE OF ISSUE: <u>31/07/2013</u>

ADDRESS: 11/F, CENTRE POINT, 181-185, GLOUCESTER ROAD,

WANCHAI, HONG KONG

### PROJECT: ---

#### METHOD OF PERFORMANCE CHECK/ CALIBRATION:

Ref: APHA22nd ed 2130B

### **COMMENTS**

It is certified that the item under performance check/calibration has been calibrated/checked by corresponding calibrated equipment in the laboratory.

Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.

Scope of Test:	Turbidity	
Equipment Type:	Turbidimeter	
Brand Name:	Xin Rui	
Model No.:	WGZ-3B	
Serial No.:	1203016	
Equipment No.:		
Date of Calibration:	31 July, 2013	

### Remarks:

This is the Final Report. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr. Peter Lee

Director

**WORK ORDER:** <u>HK1310007</u> **DATE OF ISSUE:** <u>31<sup>st</sup> July, 2013</u>

**CLIENT: LAM GEOTECHNICS LIMITED** 

<b>Equipment Type:</b>	Turbidimeter	
Brand Name:	Xin Rui	
Model No.:	WGZ-3B	
Serial No.:	1203016	
Equipment No.:		
Date of Calibration:	31 July, 2013	
Date of next Calibration:	30 October, 2013	

### Parameters:

## **Turbidity**

Method Ref: APHA 22<sup>nd</sup> ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.02	+0.2
4	3.85	-3.8
10	9.68	-3.2
40	42.1	+5.2
100	96.0	-4.0
400	387	-3.2
1000	985	-1.5
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.

Mr. Peter Lee

Director

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## ALS Technichem (HK) Pty Ltd

## REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:

MS EMILY KONG

CLIENT:

LAM GEOTECHNICS LIMITED

ADDRESS:

11/F., CENTRE POINT,

181-185 GLOUCESTER ROAD,

WAN CHAI, HONG KONG

PROJECT:

WORK ORDER:

HK1317591

LABORATORY:

HONG KONG

DATE RECEIVED:

03/07/2013

DATE OF ISSUE:

12/07/2013

### **COMMENTS**

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.

Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:

Dissolved Oxygen, pH, Salinity and Temperature

Equipment Type:

Sonde Environmental Monitoring System

Brand Name:

Model No.:

Professional plus

Serial No.:

11F100597

Equipment No.:

Date of Calibration: 10 July, 2013

#### NOTES

This is the Final Report and supersedes any preliminary report with this batch number. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

### ISSUING LABORATORY: HONG KONG

#### Address

ALS Technichem (HK) Ptv Ltd

11/F Chung Shun Knitting Centre

1-3 Wing Yip Street

Kwai Chung HONG KONG Phone:

852-2610 1044

Fax:

852-2610 2021

Email:

hongkong@alsglobal.com

Mr. Fung Lim Che Richard

General Manager

Greater China & Hong Kong

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Page 1 of 2

Work Order: Date of Issue: HK1317591

Cliant

12/07/2013

Client:

LAM GEOTECHNICS LIMITED



Equipment Type:

Sonde Environmental Monitoring System

Brand Name:

YSI

Model No.:

Professional plus

Serial No.:

11F100597

Equipment No.: Date of Calibration:

--

101

10 July, 2013

Date of next Calibration:

10 October, 2013

Parameters:

**Dissolved Oxygen** 

Method Ref: APHA (21st edition), 45000: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
4.52	4.63	0.11
6.72	6.53	-0.19
7.80	7.71	-0.09
	Tolerance Limit (±mg/L)	0.20

pH Value

Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	3.92	-0.08
7.0	7.08	0.08
10.0	10.07	0.07
	Tolerance Limit (±pH unit)	0.20

Salinity

Method Ref: APHA (21st edition), 2520B

Method Rel: Al TIA (213t carton), 2320b			
Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)	
0	0.00		
10	9.49	-5.1	
20	19.02	-4.9	
30	29.29	-2.4	
	-		
	Tolerance Limit (+%)	10.0	

**Temperature** 

Method Ref: Section 6 of International Accreditation New Zealand Technical

Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C )	Displayed Reading (°C )	Tolerance (°C )
10.0 22.5	11.2 23.6	1.2
39.0	38.8	-0.2
	Tolerance Limit (±°C)	2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard

General Manager -

Greater China & Hong Kong



## ALS Technichem (HK) Pty Ltd

## REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:

MR DEREK LO

CLIENT:

LAM GEOTECHNICS LIMITED

ADDRESS:

11/F., CENTRE POINT,

181-185 GLOUCESTER ROAD,

WAN CHAI, HONG KONG

PROJECT:

WORK ORDER:

HK1327829

LABORATORY:

HONG KONG

DATE RECEIVED:

09/10/2013

DATE OF ISSUE:

17/10/2013

### **COMMENTS**

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.

Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:

Dissolved Oxygen, pH, Salinity and Temperature

Equipment Type:

Multimeter

Brand Name: Model No.:

YSI

Professional plus

Serial No.:

11F100597

Equipment No.:

Date of Calibration: 15 October, 2013

#### NOTES

This is the Final Report and supersedes any preliminary report with this batch number. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

### ISSUING LABORATORY: HONG KONG

#### Address

ALS Technichem (HK) Ptv Ltd

11/F Chung Shun Knitting Centre

Life Sciences

1-3 Wing Yip Street

Kwai Chung HONG KONG Phone:

852-2610 1044

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852-2610 2021

Email:

hongkong@alsglobal.com

Mr. Fung Lim Chee General Manager

Greater China & Hong Kong

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Page 1 of 2

Work Order: Date of Issue: HK1327829 17/10/2013

Client:

LAM GEOTECHNICS LIMITED



Equipment Type:

Multimeter

Brand Name:

YSI

Model No.:

Professional plus 11F100597

Serial No.:

--

Equipment No.: Date of Calibration:

15 October, 2013

Date of next Calibration:

15 January, 2014

Parameters:

**Dissolved Oxygen** 

Method Ref: APHA (21st edition), 45000: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
	1.00	0.04
1.85	1.89	0.04
5.22	5.37	0.15
7.95	7.96	0.01
	Tolerance Limit (±mg/L)	0.20

pH Value

Method Ref: APHA (21st edition), 4500H:B

Method Reli / H Tix (215t cartion), 15001115		
Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.01	0.01
7.0	6.98	-0.02
10.0	10.02	0.02
	Tolerance Limit (±pH unit)	0.20

Salinity

Method Ref: APHA (21st edition), 2520B

Method Rel. Al IIA (213t cartie	711), 23205	
Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.02	
10	9.61	-3.9
20	19.65	-1.8
30	29.86	-0.5
	Tolerance Limit (± ppt)	10.0

**Temperature** 

Method Ref: Section 6 of International Accreditation New Zealand Technical

Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C )	Displayed Reading (°C)	Tolerance (°C )
11.0	11.5	0.5
25.0	23.8 37.1	-1.2
38.0		-0.9
	Tolerance Limit (±°C)	2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard

General Manager -

Greater China & Hong Kong

ALS Technichem (HK) Pty Ltd

ALS Environmental



## ALS Technichem (HK) Pty Ltd

## REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:

MR DEREK LO

CLIENT:

LAM GEOTECHNICS LIMITED

ADDRESS:

11/F., CENTRE POINT,

181-185 GLOUCESTER ROAD,

WAN CHAI, HONG KONG

PROJECT:

WORK ORDER:

HK1326638

LABORATORY:

HONG KONG

DATE RECEIVED:

27/09/2013

DATE OF ISSUE:

07/10/2013

### **COMMENTS**

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.

Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:

Dissolved Oxygen, pH, Salinity and Temperature

Equipment Type:

Multimeter

Brand Name:

YSI

Model No.:

Professional plus

Serial No.:

11F100420

Equipment No.:

Date of Calibration: 07 October, 2013

#### **NOTES**

This is the Final Report and supersedes any preliminary report with this batch number. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

### ISSUING LABORATORY: HONG KONG

#### Address

ALS Technichem (HK) Pty Ltd

11/F Chung Shun Knitting Centre

1-3 Wing Yip Street

Kwai Chung HONG KONG Phone:

852-2610 1044

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852-2610 2021

Email:

hongkong@alsglobal.com

Mr. Fung Lim Chee. General Manager -

Greater China & Hong Kong

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Page 1 of 2

Work Order: Date of Issue: HK1326638

Client:

07/10/2013 LAM GEOTECHNICS LIMITED



Equipment Type:

Multimeter

Brand Name:

YSI

Model No.:

Professional plus

Serial No.:

11F100420

Equipment No.: Date of Calibration:

07 October, 2013

Date of next Calibration:

07 January, 2014

Parameters:

**Dissolved Oxygen** 

Method Ref: APHA (21st edition), 45000: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	
		0.01	
2.32	2.33 4.32	0.01	
4.36		-0.04	
6.30	6.29	-0.01	
	Tolerance Limit (±mg/L)	0.20	

pH Value

Method Ref: APHA (21st edition), 4500H:B

,,,,			
Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)	
4.0	4.17	0.17	
7.0	7.19	0.19	
10.0	9.96	-0.04	
	Tolerance Limit (±pH unit)	0.20	

Salinity

Method Ref: APHA (21st edition), 2520B

meenou men / m m (= 150 cure.	0.1,,	
Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.03	
10	9.94	-0.6
20	19.49	-2.6
30	29.55	-1.5
	Tolerance Limit (±%)	10.0

**Temperature** 

Method Ref: Section 6 of International Accreditation New Zealand Technical

Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C )	Tolerance (°C )
10.0 24.0 41.0	9.8 23.1 40.4	-0.2 -0.9 -0.6
	Tolerance Limit (±°C)	2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard

General Manager

Greater China & Hong Kong



## ALS Technichem (HK) Pty Ltd

## REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:

MR DEREK LO

CLIENT:

LAM GEOTECHNICS LIMITED

ADDRESS:

11/F., CENTRE POINT.

181-185 GLOUCESTER ROAD,

WAN CHAI, HONG KONG

PROJECT:

WORK ORDER:

HK1325265

LABORATORY: DATE RECEIVED: HONG KONG

13/09/2013

DATE OF ISSUE:

25/09/2013

### **COMMENTS**

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.

Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:

Dissolved Oxygen

**Equipment Type:** 

SONDE ENVIRONMENTAL MONITORING

Brand Name:

YSI

Model No.: Serial No.:

600 XL 05C1607

Equipment No.:

Date of Calibration: 23 September, 2013

#### NOTES

This is the Final Report and supersedes any preliminary report with this batch number. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

## ISSUING LABORATORY: HONG KONG

### **Address**

ALS Technichem (HK) Pty Ltd

11/F Chung Shun Knitting Centre

1-3 Wing Yip Street

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hongkong@alsglobal.com

Richard Mr. Fung Lim Chee General Manager

Greater China & Hong Kong

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Page 1 of 2

Work Order:

HK1325265

Date of Issue:

25/09/2013

Client:

LAM GEOTECHNICS LIMITED



Equipment Type:

SONDE ENVIRONMENTAL MONITORING

Brand Name:

YSI

Model No.:

600 XL 05C1607

Serial No.: Equipment No.:

Date of Calibration:

23 September, 2013

Date of next Calibration:

23 December, 2013

Parameters:

**Dissolved Oxygen** 

Method Ref: APHA (21st edition), 45000: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	
	2.22	0.10	
3.09	2.96	-0.13	
5.71	5.76	0.05	
7.24	7.18	-0.06	
	T-l	0.30	
	Tolerance Limit (±mg/L)	0.20	

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee Richard General Manager

Greater China & Hong Kong



## ALS Technichem (HK) Pty Ltd

## REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:

MS EMILY KONG

CLIENT:

LAM GEOTECHNICS LIMITED

ADDRESS:

11/F., CENTRE POINT,

181-185 GLOUCESTER ROAD,

WAN CHAI, HONG KONG

PROJECT:

WORK ORDER: HK1319020

AMENDMENT NO.:

LABORATORY:

HONG KONG 15/07/2013

DATE RECEIVED: DATE OF ISSUE:

09/10/2013

### **COMMENTS**

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.

Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:

Dissolved Oxygen, pH, Salinity and Temperature

Equipment Type:

**MULTIMETER** 

Brand Name: Model No.:

YSI 600XL

Serial No .:

05C1607

Equipment No.:

Date of Calibration: 25 July, 2013

#### **NOTES**

This is the Final Report and supersedes any preliminary report with this batch number. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

## ISSUING LABORATORY: HONG KONG

#### **Address**

ALS Technichem (HK) Pty Ltd

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Mr. Fung Lim Chee, Richard

General Manager

Greater China & Hong Kong

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Page 1 of 2

Work Order:

HK1319020

Amendment No.:

- 1

Date of Issue:

09/10/2013

Client:

LAM GEOTECHNICS LIMITED



Equipment Type:

**MULTIMETER** 

Brand Name:

YSI

Model No.: Serial No.: 600XL 05C1607

Equipment No.:

--

Date of Calibration:

25 July, 2013

Date of next Calibration:

25 October, 2013

Parameters:

Dissolved Oxygen

Method Ref: APHA (21st edition), 45000: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	
4.82	5.11	0.29	
6.22	6.45	0.23	
7.60	8.00	0.40	
	Tolerance Limit (±mg/L)	0.20	

pH Value

Method Ref: APHA (21st edition), 4500H:B

	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Expected Reading (pH Unit)		Displayed Reading (pH Unit)	Tolerance (pH unit)	
4.0		4.06	0.06	
	7.0	6.99	-0.01	
	10.0	9.98	-0.02	
		Tolerance Limit (±pH unit)	0.20	

Salinity

Method Ref: APHA (21st edition), 2520B

Method Ref. Al TIA (213t edition), 23208				
	Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)	
	0	0		
	10	10.10	1.0	
	20	18.68	-6.6	
	30	30.11	0.4	
		Tolerance Limit (±%)	10.0	

**Temperature** 

Method Ref: Section 6 of International Accreditation New Zealand Technical

Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Calac Not 5 Second carron march 2000 troning the march 2000				
Expected Reading (°C )	Displayed Reading (°C )	Tolerance (°C )		
10	10.05			
20	19.47 41.09	-0.5 0.1		
	Tolerance Limit (±°C) 2.0			

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard

General Manager

Greater China & Hong Kong

ALS Technichem (HK) Pty Ltd

ALS Environmental

Page 2 of 2



TISCH ENVIROMENTAL, INC. 145 SOUTH MIAMI AVE. VILLAGE OF CLEVES, OH 45002 513.467.9000 877.263.7610 TOLL FREE 513.467.9009 FAX WWW.TISCH-ENV.COM

#### AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Ju Operator		Rootsmeter Orifice I.I	,	438320 0005	Ta (K) - Pa (mm) -	759.46
					METER	ORFICE
PLATE	VOLUME	VOLUME	DIFF	DIFF	DIFF	DIFF
OR	START	STOP	VOLUME	TIME	Hg	H2O
Run #	(m3)	(m3)	(m3)	(min)	(mm)	(in.)
1	NA	NA	1.00	1.3910	.3.2	2.00
2	NA	NA	1.00	0.9830	6.4	4.00
3	NA	NA	1.00	0.8800	7.9	5.00
4	NA	NA	1.00	0.8380	8.8	5.50
5	NA	NA	1.00	0.6930	12.7	8.00

#### DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9884 0.9843 0.9822 0.9811 0.9760	0.7106 1.0013 1.1161 1.1708 1.4084	1.4090 1.9926 2.2278 2.3365 2.8180		0.9958 0.9916 0.9895 0.9884 0.9832	0.7159 1.0087 1.1244 1.1795 1.4188	0.8888 1.2570 1.4054 1.4740 1.7777
Qstd slop intercept coefficie	(b) = ent (r) =	2.01968 -0.02746 0.99999		Qa slope intercept coefficie	t (b) = ent (r) =	1.26469 -0.01732 0.99999
y axis =	SQRT[H2O(F	Pa/760)(298/	ľa)]	y axis =	SQRT[H2O(7	[a/Pa)]

#### CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]

Qa = Va/Time

For subsequent flow rate calculations:

Qstd =  $1/m\{ [SQRT (H2O (Pa/760) (298/Ta))] - b \}$ Qa =  $1/m\{ [SQRT H2O (Ta/Pa)] - b \}$ 



Calibration Due Date	I-13
Name	p-13
Name	
Name	
Name	
Calibration   Calibration	
Calibration Date   19-Jul-12   Calibration Date   19-Jul-13   Calibration Date   19-Jul-13   Calibration Date   19-Jul-13   Calibration Date   19-Jul-13   Calibration Oate   19-Jul-13   Calibration of RSP	mmHg
Equipment No.   EL086   Slope, m <sub>c</sub>   2.01145   Intercept, bc   -0.028	
Last Calibration Date         19-Jul-12 $(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$ Next Calibration Date         19-Jul-13 $(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$ Calibration of RSP           Calibration         Manometer Reading         Q std         Continuous Flow         IC           Point         H (inches of water) $(m^3 / min.)$ Recorder, W $(W(P_a/1013.3 \times 298 / T_a)^{-1/2}$ 1         6.2         6.2         12.4         1.7416         61         60.197           2         5.1         5.1         10.2         1.5808         53         52.302           3         4.1         4.1         8.2         1.4188         46         45.395           4         2.5         2.5         5.0         1.1110         32         31.579           5         1.4         1.4         2.8         0.8349         21         20.723           Slope, m = 43.5073         Intercept, b = -16.1479           Carrelation Coefficient*         = 0.9994           Calibration Accepted         Yes/No**    **Delete as appropriate.	
Calibration Date   19-Jul-13   = m <sub>c</sub> x Q <sub>std</sub> + b <sub>c</sub>	803
Calibration of RSP           Calibration         Manometer Reading         Q std (m³ / min.)         Continuous Flow (W(P,J1013.3x298/T)         IC           Point         H (inches of water)         (m³ / min.)         Recorder, W         (W(P,J1013.3x298/T)           1         6.2         6.2         12.4         1.7416         61         60.197/T           2         5.1         5.1         10.2         1.5808         53         52.3028/T           3         4.1         4.1         8.2         1.4188         46         45.395/T           4         2.5         2.5         5.0         1.1110         32         31.579/T           5         1.4         1.4         2.8         0.8349         21         20.723/T           By Linear Regression of Y on X           Slope, m = 43.5073         Intercept, b = -16.1479           Correlation Coefficient* = 0.9994           Calibration Accepted = Yes/Ne**   **Delete as appropriate.	
Calibration         Manometer Reading         Q std         Continuous Flow         IC           Point         H (inches of water)         (m³ / min.)         Recorder, W         (W(P₂/1013.3x298/r)           (up)         (down)         (difference)         X-axis         (CFM)         Y-axis           1         6.2         6.2         12.4         1.7416         61         60.197           2         5.1         5.1         10.2         1.5808         53         52.3029           3         4.1         4.1         8.2         1.4188         46         45.3950           4         2.5         2.5         5.0         1.1110         32         31.579           5         1.4         1.4         2.8         0.8349         21         20.7236           By Linear Regression of Y on X           Slope, m = 43.5073         Intercept, b = -16.1479           Correlation Coefficient* = 0.9994	
Point         H (inches of water)         (m³ / min.)         Recorder, W         (W/P <sub>s</sub> /1013.3x298/V           1         6.2         6.2         12.4         1.7416         61         60.1977           2         5.1         5.1         10.2         1.5808         53         52.3029           3         4.1         4.1         8.2         1.4188         46         45.3950           4         2.5         2.5         5.0         1.1110         32         31.579           5         1.4         1.4         2.8         0.8349         21         20.7230           By Linear Regression of Y on X           Slope, m         =         43.5073         Intercept, b         =         -16.1479           Correlation Coefficient*         =         0.9994           Calibration Accepted         =         Yes/Ne**    ** Delete as appropriate.	
(up)         (down)         (difference)         X-axis         (CFM)         Y-axis           1         6.2         6.2         12.4         1.7416         61         60.1977           2         5.1         5.1         10.2         1.5808         53         52.3029           3         4.1         4.1         8.2         1.4188         46         45.3950           4         2.5         2.5         5.0         1.1110         32         31.579           5         1.4         1.4         2.8         0.8349         21         20.7230           By Linear Regression of Y on X           Slope, m = 43.5073 Intercept, b = -16.1479           Correlation Coefficient* = 0.9994           Calibration Accepted = Yes/Ne**    ** Delete as appropriate.	
1       6.2       6.2       12.4       1.7416       61       60.1977         2       5.1       5.1       10.2       1.5808       53       52.3028         3       4.1       4.1       8.2       1.4188       46       45.3950         4       2.5       2.5       5.0       1.1110       32       31.579         5       1.4       1.4       2.8       0.8349       21       20.7238         By Linear Regression of Y on X         Slope, m = 43.5073 Intercept, b = -16.1479         Correlation Coefficient* = 0.9994         Calibration Accepted = Yes/Ne**     *If Correlation Coefficient < 0.990, check and recalibration again.  **Delete as appropriate.	T <sub>a</sub> ) <sup>1/2</sup> /35.31)
2 5.1 5.1 10.2 1.5808 53 52.3028 3 4.1 4.1 8.2 1.4188 46 45.3950 4 2.5 2.5 5.0 1.1110 32 31.5799 5 1.4 1.4 2.8 0.8349 21 20.7238  By Linear Regression of Y on X  Slope, m = 43.5073 Intercept, b = -16.1479  Correlation Coefficient* = 0.9994  Calibration Accepted = Yes/Ne**	š
3 4.1 4.1 8.2 1.4188 46 45.3950 4 2.5 2.5 5.0 1.1110 32 31.579 5 1.4 1.4 2.8 0.8349 21 20.7238  By Linear Regression of Y on X  Slope, m = 43.5073 Intercept, b = -16.1479  Correlation Coefficient* = 0.9994  Calibration Accepted = Yes/Ne**	7
4       2.5       2.5       5.0       1.1110       32       31.579°         5       1.4       1.4       2.8       0.8349       21       20.7236         By Linear Regression of Y on X         Slope, m = 43.5073 Intercept, b = -16.1479         Correlation Coefficient* = 0.9994       0.9994       -16.1479         Calibration Accepted = Yes/Ne**       Yes/Ne**	9
5 1.4 1.4 2.8 0.8349 21 20.7238  By Linear Regression of Y on X  Slope, m = 43.5073 Intercept, b = -16.1479  Correlation Coefficient* = 0.9994  Calibration Accepted = Yes/Ne**  * if Correlation Coefficient < 0.990, check and recalibration again.  ** Delete as appropriate.	0
By Linear Regression of Y on X  Slope, m = 43.5073 Intercept, b = -16.1479  Correlation Coefficient* = 0.9994  Calibration Accepted = Yes/Ne**  * if Correlation Coefficient < 0.990, check and recalibration again.  ** Delete as appropriate.	1
Slope, m = 43.5073 Intercept, b = -16.1479  Correlation Coefficient* = 0.9994  Calibration Accepted = Yes/Ne**  * if Correlation Coefficient < 0.990, check and recalibration again.  ** Delete as appropriate.	8
Correlation Coefficient* = 0.9994  Calibration Accepted = Yes/Ne**  * if Correlation Coefficient < 0.990, check and recalibration again.  ** Delete as appropriate.	
Calibration Accepted = Yes/Ne**  * if Correlation Coefficient < 0.990, check and recalibration again.  ** Delete as appropriate.	
* if Correlation Coefficient < 0.990, check and recalibration again.  ** Delete as appropriate.	
** Delete as appropriate.	
** Delete as appropriate.	
** Delete as appropriate.	
Remarks :	
Calibrated by : Sam Checked by : Derek	Lo
Date : 17-Jul-13	I-13



Location

Equipment no.

CMA2a

EL449

## **Calibration Data for High Volume Sampler (TSP Sampler)**

**Calbration Date** 

Calbration Due Dat :

17-Jul-13

17-Sep-13

CALIBRATION OF CON	TINUOUS	FLOW RE	CORDER								
			A	mbient Co	ndition						
Temperature, T <sub>a</sub>		305		Kelvin	Pressure, P	a		1010	mmHg		
			Orifice Tra	nsfer Stand	dard Informa	ation					
Equipment No.		EL086		Slope, m <sub>c</sub>	2.011	45 II	ntercept, b	С	-0.02803		
Last Calibration Date		19-Jul-12	2		(Hxl	P <sub>a</sub> / 1013	.3 x 298	$/T_a)^{1}$	/2		
Next Calibration Date		19-Jul-13	$= m_c \times Q_{std} + b_c$								
			c	Calibration	of RSP						
Calibration	Man	ometer Re	eading	Q	std	Continuo	us Flow		IC		
Point	H (i	inches of v	vater)	(m <sup>3</sup> ,	min.)	Record	ler, W	(W(P <sub>a</sub> /101	3.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31)		
	(up)	(down)	(difference)	X-	axis	(CF	M)		Y-axis		
1	6.1	6.1	12.2	1.7	276	59	)		58.2240		
2	5.0	5.0	10.0	1.5654		51			50.3292		
3	4.2	4.2	8.4	1.4359 43			3		42.4344		
4	2.5	2.5	5.0	1.1	110	26	3		25.6580		
5	1.5	1.5	3.0	0.8	8637	14	+		13.8159		
By Linear Regression of	Y on X										
	Slope, m	=	51.8	624	Int	ercept, b =	-3	31.4400			
Correlation Co	pefficient*	=.	0.99	996							
Calibration	Accepted	=	Yes/	No**							
if Correlation Coefficien	t < 0.990,	check and	recalibration	ı again.							
* Delete as appropriate.											
Remarks :											
Calibrated by		Sam				Checked	by	:	Derek Lo		
Date	1	7-Jul-13				Date		:	17-Jul-13		



Location :		CMA3a			Calbration Date				22-Aug-13		
Equipment no. :		EL333				Calbr	ation Due Dat	:	22-Oct-13		
								-			
CALIBRATION OF CON	ITINUOUS	FLOW RE	CORDER								
	•		Α	mbient Co	ndition						
Temperature, T <sub>a</sub>		305		Kelvin	Pressure, P	a		101	0 mmHg		
			Orifice Tra	nsfer Stan	dard Informa	ation					
Equipment No.		EL086		Slope, m <sub>c</sub>	2.019	68	Intercept, be	С	-0.02746		
Last Calibration Date	e 15-Jul-13				(HxI	P <sub>a</sub> / 10	13.3 x 298	/ T	a) 1/2		
Next Calibration Date		15-Jul-1	4		=	$= m_c \times Q_{std} + b_c$					
			C	Calibration	of RSP						
Calibration	Mar	nometer R	eading	Q std Continuous Flow					IC		
Point	Н (	inches of	water)	(m <sup>3</sup>	n <sup>3</sup> / min.) Recorder, W			(W(	P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31)		
	(up)	(down)	(difference)	x-	X-axis		(CFM)		Y-axis		
1	5.8	5.8	11.6	1.0	1.6778		58		57.2371		
2	4.8	4.8	9.6	1.9	5275		49		48.3555		
3	4.0	4.0	8.0	1.3	3956		42		41.4476		
4	2.4	2.4	4.8	1.0	0841		25		24.6712		
5	1.6	1.6	3.2	0.8	8877		14		13.8159		
By Linear Regression of	Y on X										
	Slope, m	=	54.5	515	Int	ercept, b	= -3	34.6	041		
Correlation C	oefficient*	=	0.99	999							
Calibration	Accepted	=	Yes/	No**							
* if Correlation Coefficier	st + 0 000	ahaak and	rocalibration	ogoin							
ii Correlation Coefficier	ii < 0.990,	спеск апо	recalibration	ı agaın.							
** Delete as appropriate.											
Remarks :											
Calibrated by		Henry				Chec	ked by	:	Derek Lo		
Date :	2	2-Aug-13				Date		:	22-Aug-13		



Location :		CMA4a				Calbrati	on Date	:	17-Jul-13
Equipment no.		EL390				Calbrati	on Due Dat	:	17-Sep-13
								_	
CALIBRATION OF CON	ITINUOUS	FLOW RE	CORDER						
			A	mbient Co	ndition				
Temperature, T <sub>a</sub>		305		Kelvin	Pressure, P	a		1010	mmHg
			Orifice Tra	nsfer Stan	dard Informa	ation			
Equipment No.		EL086		Slope, m <sub>c</sub>	2.0114	45	Intercept, be	С	-0.02803
Last Calibration Date	te 19-Jul-12				(HxI	P <sub>a</sub> / 1013	3.3 x 298	/ T <sub>a</sub>	) 1/2
Next Calibration Date		19-Jul-1	3				$Q_{std} + b_c$		
			C	alibration	of RSP				
Calibration	Mar	nometer R	eading	c	l <sub>std</sub>	Continue	ous Flow		IC
Point	Н (	inches of	water)	(m <sup>3</sup>	(m <sup>3</sup> / min.) Recorder,		der, W	(W(Pa	/1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31)
	(up)	(down)	(difference)	X-axis		(CI	=M)		Y-axis
1	6.0	6.0	12.0	1.7	7135	6	51		60.1977
2	5.0	5.0	10.0	1.5	5654	5	i4		53.2897
3	4.1	4.1	8.2	1.4	4188	4	ŀ6		45.3950
4	2.5	2.5	5.0	1.1	1110	3	31		30.5923
5	1.5	1.5	3.0	0.8	3637	1	9		18.7501
By Linear Regression of	Y on X								
	Slope, m	=	48.9	540	Int	ercept, b =	-2	23.683	32
Correlation C	oefficient*	=	0.99	99					
Calibration	Accepted	=	Yes/ <del>I</del>	<del>\0</del> **					
* if Correlation Coefficien	nt < 0.990,	check and	recalibration	again.					
				Ū					
** Delete as appropriate.									
Remarks :									
Calibrated by		Sam				Checke	d by	:	Derek Lo
Date :	1	7-Jul-13				Date		:	17-Jul-13



Location		CIVIAGA				Calbrat	ion Date	•	1 <i>1-</i> Jul-13
Equipment no.		EL380			Calbrat	ion Due Dat	:	17-Sep-13	
								-	
CALIBRATION OF CON	ITINILIOUI	e EL OW D	CORRER						
CALIBRATION OF CON	ITINUOUS	S FLOW R							
	T .		Α	mbient Co			1		
Temperature, T <sub>a</sub>		305	ı	Kelvin	Pressure, P	a		1010	mmHg
			Orifice Tra	nsfer Stan	dard Informa	ation			
Equipment No.		EL086		Slope, m <sub>c</sub>	2.0114	45	Intercept, b	С	-0.02803
Last Calibration Date		19-Jul-12	2		(Hxl	P <sub>a</sub> / 101.	3.3 x 298	/ T <sub>a</sub> )	1/2
Next Calibration Date		19-Jul-1	3		=	$m_c x$	$Q_{std} + b_c$	;	
			C	alibration	of RSP				
Calibration	Mar	nometer R	eading	C	IC				
Point	Н(	inches of	water)	(m <sup>3</sup>	/ min.)	der, W	(W(P <sub>a</sub> /1	013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31)	
	(up)	(down)	(difference)	X-	X-axis (CFM		FM)		Y-axis
1	6.1	6.1	12.2	1.	1.7276 61		61		60.1977
2	4.9	4.9	9.8	1.5	1.5498 53		53		52.3029
3	4.0	4.0	8.0	1.4	4016	2	16		45.3950
4	2.4	2.4	4.8	1.0	0888	3	31		30.5923
5	1.5	1.5	3.0	0.8	3637	2	20		19.7369
By Linear Regression of	Y on X								
	Slope, m	=	46.9	543	Inte	ercept, b =	= -2	20.6306	i
Correlation Co	oefficient*	=	0.99	99					
Calibration	Accepted	=	Yes/l	No**					
* if Correlation Coefficier	nt < 0.990,	, check and	l recalibratio	n again.					
** Delete as appropriate.									
Remarks :									
		Sam				Checke	d by		Derek Lo
Calibrated by		17-Jul-13				Date	,	· —	17-Jul-13
Date		11-Jul-13				Date		•	17-301-13



Location :		CMA6a			Calbration Date : 17-				
Equipment no. :		EL448				Calbr	ation Due Dat	: _	17-Sep-13
								_	
	ITINILIOLIS	S EL OW D	CODDED						
CALIBRATION OF CON	TINOOOS	S FLOW K							
				mbient Co					
Temperature, T <sub>a</sub>		305		Kelvin	Pressure, P	a		1010	) mmHg
			Orifice Tra	nsfer Stan	dard Informa	ation			
Equipment No.		EL086		Slope, m <sub>c</sub>	2.011	45	Intercept, b	С	-0.02803
Last Calibration Date		19-Jul-1	2		(Hxl	P <sub>a</sub> / 10	13.3 x 298	/ T	a) <sup>1/2</sup>
Next Calibration Date		19-Jul-1	3		=	$m_c$	$x Q_{std} + b_{d}$	:	
			C	alibration	of RSP				
Calibration	Mar	nometer R	eading	C	std	Contir	nuous Flow		IC
Point	H (i	inches of	water)	(m <sup>3</sup>	/ min.)	Rec	order, W	(W(F	P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31)
	(up)	(down)	(difference)	X-	axis	(	(CFM)		Y-axis
1	6.1	6.1	12.2	1.	7276		60		59.2108
2	5.0	5.0	10.0	1.5	5654		52		51.3161
3	4.1	4.1	8.2	1.4	1188		44		43.4213
4	2.5	2.5	5.0	1.	1110		30		29.6054
5	1.5	1.5	3.0	0.8	3637		19		18.7501
By Linear Regression of	Y on X								
	Slope, m	=	46.8	114	Inte	ercept, b	= -2	22.14	02
Correlation Co	pefficient*	=	0.99	994					
Calibration	Accepted	=	Yes/	No**					
if Correlation Coefficier	nt < 0.990,	check and	l recalibratio	n again.					
** Delete as appropriate.									
Remarks :									
Tomaino .									
		Sam				Check	ked by	:	Derek Lo
Calibrated by	1	7-Jul-13				Date		· -	17-Jul-13
Date	'	, oui-10				Date		٠	ir dul-10



Location :	: CMA5a					Calbra	ation Date	:	16-Sep-13
Equipment no.		EL380				Calbra	ation Due Dat	:	16-Nov-13
CALIBRATION OF CON	ITINUOUS	S FLOW R	ECORDER						
				mbient Co	ndition				
Temperature, T <sub>a</sub>		304	ļ	Kelvin	Pressure, P	a		1008	mmHg
			Orifice Tra	nsfer Stan	dard Informa	ation			
Equipment No.		EL086		Slope, m <sub>c</sub>	2.0196	68	Intercept, b	С	-0.02746
Last Calibration Date		15-Jul-1	3		(HxF	P <sub>a</sub> / 10	13.3 x 298	/T <sub>a</sub>	) 1/2
Next Calibration Date		$= m_c \times Q_{std} + b$							
			C	alibration	of RSP				
Calibration	Mar	nometer R	eading	C	l <sub>std</sub>	Contin	uous Flow		IC
Point	Н (	inches of	water)	(m <sup>3</sup>	min.) Recorder, W			(W(P <sub>a</sub> /	/1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31)
	(up)	(down)	(difference)	X-	axis	(CFM)			Y-axis
1	6.1	6.1	12.2	1.	7214	61			60.2369
2	5.1	5.1	10.2	1.5	5751		53		52.3370
3	4.1	4.1	8.2	1.4	4137		45		44.4370
4	2.4	2.4	4.8	1.0	0848		30		29.6247
5	1.5	1.5	3.0	0.8	3605		20		19.7498
By Linear Regression of	Y on X								
	Slope, m	=	46.6	426	Inte	ercept, b	= -2	20.808	3
Correlation Co	oefficient*	=	0.99	994					
Calibration	Accepted	=	Yes/l	No**					
* if Correlation Coefficier	nt < 0 990	check and	1 recalibratio	n again					
ii Gorrelation Goeilloici	11 < 0.000,	oncok ank	2 recalibratio	ir agairi.					
** Delete as appropriate.									
Remarks :									
Calibrated by		Sam				Check	ed by	:	Derek Lo
Date	1	6-Sep-13				Date		:	16-Sep-13



Location :		CMA4a				Calbra	ition Date	:	16-Sep-13
Equipment no. :		EL390				Calbra	tion Due Dat	:	16-Nov-13
CALIBRATION OF CON	NTINUOUS	S FLOW R	ECORDER					_	
			A	mbient Co	ndition				
Temperature, T <sub>a</sub>		304		Kelvin	Pressure, P	a		1008	mmHg
			Orifice Tra	nsfer Stan	dard Informa	ation			
Equipment No.		EL086		Slope, m <sub>c</sub>	2.019	68	Intercept, b	С	-0.02746
Last Calibration Date		15-Jul-1	3		(Hxl	P <sub>a</sub> / 10	13.3 x 298	/T <sub>a</sub>	) 1/2
Next Calibration Date		15-Jul-1	1		=	m <sub>c</sub> x	$Q_{std} + b_c$	;	
			C	alibration	of RSP				
Calibration	Mar	nometer R	eading	C	std	Contin	uous Flow		IC
Point	Н (	inches of	water)	(m <sup>3</sup>	m <sup>3</sup> / min.) Record		order, W	(W(P <sub>i</sub>	<sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31)
	(up)	(down)	(difference)	X-	X-axis (CF		CFM)		Y-axis
1	6.2	6.2	12.4	1.7	1.7353		62		61.2244
2	5.1	5.1	10.2	1.5	1.5751		52		51.3495
3	4.1	4.1	8.2	1.4	1137		44		43.4495
4	2.5	2.5	5.0	1.1	1069		29		28.6372
5	1.6	1.6	3.2	0.8	3882		17		16.7873
By Linear Regression of	Y on X								
	Slope, m	=	51.4	211	Inte	ercept, b	= -2	28.812	25
Correlation C	oefficient*	=	0.99	993					
Calibration	Accepted	=	Yes/l	No**					
* if Correlation Coefficier	nt < 0.990,	check and	l recalibratio	n again.					
** Delete as appropriate	<u>.</u>								
Remarks :									
Calibrated by		Sam				Check	ed by	:	Derek Lo
Date	1	6-Sep-13				Date		: -	16-Sep-13
Date									



Location :		CMA2a				Calbr	ation Date	:	16-Sep-13	
Equipment no.		EL449		Calbration Due Dat :					16-Nov-13	
								_		
CALIBRATION OF COL	NTINILIOLI	S EL OW D	ECORDER							
CALIBRATION OF COI	VI IIVOOO	31 LOW K		mbiant Ca						
Tomporature T		20.4		mbient Co	Pressure, P			100	0	
Temperature, T <sub>a</sub>		304	+	Kelvin	Pressure, P	a		100	8 mmHg	
			Orifice Tra	nsfer Stan	dard Inform	ation				
Equipment No.		EL086		Slope, m <sub>c</sub>	2.019	68	Intercept, b	С	-0.02746	
Last Calibration Date		15-Jul-1	3		(HxI	P <sub>a</sub> / 10	13.3 x 298	/ T	a) <sup>1/2</sup>	
Next Calibration Date		15-Jul-1	4		=	$m_c$	$x Q_{std} + b_c$	;		
			C	alibration	of RSP					
Calibration	Mar	nometer R		l	Q <sub>std</sub> Continuous Flow					
Point		inches of		(m <sup>3</sup>	/ min.)	min.) Recorder, W		(W(I	P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31)	
	(up)	(down)	(difference)		axis	(CFM)			Y-axis	
1	6.1	6.1	12.2		,		58		57.2744	
2	5.1	5.1	10.2	1.5			50		49.3745	
3	4.2	4.2	8.4	1.4	4307		43		42.4621	
4	2.5	2.5	5.0	1.	1069		28		27.6497	
5	1.4	1.4	2.8	0.8	3317		16		15.7998	
By Linear Regression of	f Y on X									
, c	Slope, m	=	46.3	065	Int	ercept, b	= -2	23.22	217	
Correlation C		=	0.99			• /			<del></del>	
Calibration		=	Yes/l							
* if Correlation Coefficie	nt < 0.990	, check and	d recalibratio	n again.						
** Delete as appropriate	ı.									
Doloto do appropriato	•									
Remarks :										
Calibrated by		Sam				Chec	ked by	:	Derek Lo	
Date :	1	6-Sep-13				Date		:	16-Sep-13	



Location :		CMA1b				Calbr	ation Date	:	16-Sep-13
Equipment no. :		EL452				Calbr	ation Due Da	1:	16-Nov-13
								-	
CALIBRATION OF CON	ITINUOUS	S FLOW R	<u>ECORDER</u>						
				mbient Co	ndition				
Temperature, T <sub>a</sub>		304		Kelvin	Pressure, P	a		100	D8 mmHg
			Orifice Tra	nsfer Stan	dard Informa	ation			
Equipment No.		EL086		Slope, m <sub>c</sub>	2.019	68	Intercept, b	С	-0.02746
Last Calibration Date		15-Jul-1	3		(Hxl	P <sub>a</sub> / 10	13.3 x 298	3/7	a) <sup>1/2</sup>
Next Calibration Date		15-Jul-1	4				$x Q_{std} + b_{d}$		
			C	alibration	of RSP				
Calibration	Mar	nometer R	eading	Q <sub>std</sub> Continuous Flow					IC
Point	Н (і	inches of	water)	(m <sup>3</sup>	Recorder, W				(P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31)
	(up)	(down)	(difference)	x-	axis	(CFM)			Y-axis
1	6.1	6.1	12.2	1.	7214 61		61		60.2369
2	5.1	5.1	10.2	1.9	5751		52		51.3495
3	4.1	4.1	8.2	1.4	4137		45		44.4370
4	2.5	2.5	5.0	1.	1069		31		30.6122
5	1.5	1.5	3.0	0.8	3605		20		19.7498
By Linear Regression of	Y on X								
	Slope, m	=	46.1	726	Inte	ercept, b	= -	20.3	866
Correlation Co	oefficient*	=	0.99	987					
Calibration	Accepted	=	Yes/l	No**					
* if Correlation Coefficier	st < 0.000	chook and	l rocalibratio	n again					
ii Correlation Coemiciei	11 < 0.990,	CHECK AIR	recalibratio	ii ayaiii.					
** Delete as appropriate.									
Remarks :									
Calibrated by		Sam				Chec	ked by	:	Derek Lo
Date	1	6-Sep-13				Date		:	16-Sep-13



Calibration   Due Dat     16-Nov-13     16-Nov-13	Location :		CMA6a				Calbr	ation Date	:	16-Sep-13
Temperature, T_x   3.04   Kelvin   Pressure, P_x   1010   mmHg	Equipment no.		EL448				Calbr	ation Due Da	1:	16-Nov-13
Temperature, T_x   3.04   Kelvin   Pressure, P_x   1010   mmHg									•	
Temperature, T_x   3.04   Kelvin   Pressure, P_x   1010   mmHg										
Temperature, T₂   304   Kelvin   Pressure, P₂   1010   mmHg	CALIBRATION OF CON	ITINUOUS	S FLOW R	ECORDER						
Stope, m				Α	mbient Co	ndition				
Equipment No.   EL086   Slope, m;   2.01968   Intercept, bc   -0.02746	Temperature, T <sub>a</sub>		304	ļ	Kelvin	Pressure, P	a		101	10 mmHg
Last Calibration Date   15-Jul-13				Orifice Tra	nsfer Stan	dard Inform	ation			
Next Calibration Date   15-Jul-14	Equipment No.		EL086		Slope, m <sub>c</sub>	2.019	68	Intercept, b	С	-0.02746
Calibration   Manometer Reading   Q std   Continuous Flow   IC	Last Calibration Date		15-Jul-1	3		(HxI	P <sub>a</sub> / 10	)13.3 x 298	3/7	$\Gamma_a$ ) $^{1/2}$
Calibration         Manometer Reading H (inches of water)         Q std (m³ / min.)         Continuous Flow Recorder, W         IC (W(P,J*1013.3x298/T₂)*2*35.31)           1         6.1         6.1         12.2         1.7231         62         61.2851           2         5.0         5.0         10.0         1.5613         53         52.3889           3         4.0         4.0         8.0         1.3979         44         43.4926           4         2.5         2.5         5.0         1.1080         30         29.6541           5         1.5         1.5         3.0         0.8613         18         17.7924           By Linear Regression of Y on X           Correlation Coefficient* = 0.9995           Calibration Accepted = Yes/Ne**         16.5en.13         Intercept, b = -25.8531           ** Delete as appropriate.           Remarks :           Checked by : Derek Lo           Life-Sen.13	Next Calibration Date		15-Jul-1	4		=	$m_c$	$x Q_{std} + b_{o}$	9	
Point         H (inches of water) (up)         (m³ / min.)         Recorder, W (W(P₂/1013.3x2990T₂) <sup>1/2</sup> /35.31)           1         6.1         6.1         12.2         1.7231         62         61.2851           2         5.0         5.0         10.0         1.5613         53         52.3889           3         4.0         4.0         8.0         1.3979         44         43.4926           4         2.5         2.5         5.0         1.1080         30         29.6541           5         1.5         1.5         3.0         0.8613         18         17.7924           By Linear Regression of Y on X           Slope, m = 50.1961				C	alibration	of RSP				
(up)   (down)   (difference)   X-axis   (CFM)   Y-axis	Calibration	Mar	nometer R	eading	c	Q <sub>std</sub> Continuous Flow				IC
1       6.1       6.1       12.2       1.7231       62       61.2851         2       5.0       5.0       10.0       1.5613       53       52.3889         3       4.0       4.0       8.0       1.3979       44       43.4926         4       2.5       2.5       5.0       1.1080       30       29.6541         5       1.5       1.5       3.0       0.8613       18       17.7924         By Linear Regression of Y on X         Slope, m = 50.1961 Intercept, b = -25.8531         Correlation Coefficient* = 0.9995         Calibration Accepted = Yes/No**     ** Delete as appropriate.  Remarks:  Checked by : Derek Lo  Date : 16-Sep.13	Point	H (i	inches of	water)	(m <sup>3</sup>	<sup>3</sup> / min.) Recorder, W				(P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31)
2 5.0 5.0 10.0 1.5613 53 52.3889  3 4.0 4.0 8.0 1.3979 44 43.4926  4 2.5 2.5 5.0 1.1080 30 29.6541  5 1.5 1.5 3.0 0.8613 18 17.7924  By Linear Regression of Y on X  Slope, m = 50.1961 Intercept, b = -25.8531  Correlation Coefficient* = 0.9995  Calibration Accepted = Yes/No**  * if Correlation Coefficient < 0.990, check and recalibration again.  ** Delete as appropriate.  Remarks:  Calibrated by Sam Checked by Derek Lo		(up)	(down)	(difference)	X-	axis (CFM)		(CFM)		Y-axis
3	1	6.1	6.1	12.2	1.	7231 62		62		61.2851
4       2.5       2.5       5.0       1.1080       30       29.6541         5       1.5       1.5       3.0       0.8613       18       17.7924         By Linear Regression of Y on X         Slope, m = 50.1961 Intercept, b = -25.8531         Correlation Coefficient* = 0.9995         Calibration Accepted = Yes/Ne**         * if Correlation Coefficient < 0.990, check and recalibration again.         ** Delete as appropriate.         Remarks :         Checked by : Derek Lo         Lo Derek Lo	2	5.0	5.0	10.0	1.5	5613		53		52.3889
5       1.5       1.5       3.0       0.8613       18       17.7924         By Linear Regression of Y on X         Slope, m = 50.1961	3	4.0	4.0	8.0	1.3	3979		44		43.4926
By Linear Regression of Y on X  Slope, m = 50.1961 Intercept, b = -25.8531  Correlation Coefficient* = 0.9995  Calibration Accepted = Yes/Ne**  * if Correlation Coefficient < 0.990, check and recalibration again.  ** Delete as appropriate.  Remarks:  Calibrated by : Sam Checked by : Derek Lo	4	2.5	2.5	5.0	1.	1080		30		29.6541
Slope, m = 50.1961 Intercept, b = -25.8531  Correlation Coefficient* = 0.9995  Calibration Accepted = Yes/Ne**  * if Correlation Coefficient < 0.990, check and recalibration again.  ** Delete as appropriate.  Remarks:  Calibrated by : Sam Checked by : Derek Lo	5	1.5	1.5	3.0	0.8	3613		18		17.7924
Correlation Coefficient* = 0.9995  Calibration Accepted = Yes/Ne**  * if Correlation Coefficient < 0.990, check and recalibration again.  ** Delete as appropriate.  Remarks:  Calibrated by : Sam Checked by : Derek Lo	By Linear Regression of	Y on X								
* if Correlation Coefficient < 0.990, check and recalibration again.  ** Delete as appropriate.  **Calibrated by : Sam Checked by : Derek Lo  16-Sep-13		Slope, m	=	50.1	961	Int	ercept, b	= -	25.8	3531
* if Correlation Coefficient < 0.990, check and recalibration again.  ** Delete as appropriate.  Remarks:  Calibrated by:  Sam  Checked by:  Derek Lo  16-Sep-13	Correlation Co	oefficient*	=	0.99	995					
** Delete as appropriate.  Remarks:  Calibrated by : Sam Checked by : Derek Lo  16-Sep-13	Calibration	Accepted	=	Yes/l	Ne**					
** Delete as appropriate.  Remarks:  Calibrated by : Sam Checked by : Derek Lo  16-Sep-13										
** Delete as appropriate.  Remarks:  Calibrated by : Sam Checked by : Derek Lo  16-Sep-13										
Calibrated by Sam Checked by Derek Lo	* if Correlation Coefficier	nt < 0.990,	check and	d recalibratio	n again.					
Calibrated by : Sam Checked by : Derek Lo  16-Sep-13  Date : 16-Sep-13	** Delete as appropriate.									
Calibrated by : Sam Checked by : Derek Lo  16-Sep-13  Date : 16-Sep-13	Remarks :									
16-Sep-13										
16-Sep-13	Calibrated by		Sam				Chec	ked by	:	Derek Lo
		1	6-Sep-13				Date		:	16-Sep-13