# **High-Volume TSP Sampler**

#### 5-POINT CALIBRATION DATA SHEET



File No. MA16034/05/0040

Project No.	AM1 - Tin Hau	Temple					
Date:	9-Fe	eb-23	Next Due Date:	12	Apr-23	Operator:	SK
Equipment No.:	A-0	01-05	Model No.:	GS	S2310	Serial No.	10599
			Ambient C	ondition			
Temperatur	re. Ta (K)	292.5	Pressure, Pa			762.3	
	, ()			(8)			
		Or	ifice Transfer Sta	ndard Informa	ation		
Serial	No.	3864	Slope, mc	0.05928	Intercept		-0.03491
Last Calibra	ntion Date:						
Next Calibra	ation Date:	16-Jan-24		$Qstd = \{ [\Delta H \ x] $	(Pa/760) x (298/7	Γa)] <sup>1/2</sup> -bc} / m	c
			Calibration of	TSP Sampler			
Calibration	ATT ( = c'C' = c)		fice	O +1 (CF) ()	ANT (TIME) :	HVS	(200 FF ) 1 <sup>1/2</sup>
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	50) x (298/Ta)] <sup>1/2</sup>	Qstd (CFM) X - axis	$\Delta$ W (HVS), in. of water		50) x (298/Ta)] <sup>1/2</sup> -axis
1	13.3		3.69	62.78	10.1		3.21
2	10.5		3.28	55.85	7.4		2.75
3	7.7		2.81	47.91	5.5		2.37
4	5.7		2.41	41.30	3.5		1.89
5	3.4		1.86	32.03	2.0		1.43
By Linear Regr Slope , mw =	ession of Y on 2	X	,	Intercent, bw :	-0.453	5	
= '	coefficient* =		.9982				
*If Correlation C				-			
			Set Point Ca	alculation			
From the TSP Fi	eld Calibration	Curve, take Qstd	= 43 CFM				
From the Regres	sion Equation, t	he "Y" value acc	ording to				
		mw v C	$\mathbf{pstd} + \mathbf{bw} = [\mathbf{\Delta W} \ \mathbf{x}]$	(Do/760) v (20	09/Ta)1 <sup>1/2</sup>		
		IIIW X Q	įstu + DW – įΔW A	(1 a/700) X (2)	90/1 <i>a)</i> ]		
Therefore, Se	et Point; W = ( n	nw x Qstd + bw)	<sup>2</sup> x ( 760 / Pa ) x ( ′	$\Gamma a / 298) =$	4.08	_	
D 1							
Remarks:							
				χr	<u> </u>		
Conducted by:	Wong Sl	ning Kwai	Signature:		, •	Date:	9-Feb-23
Checked by:	Henry	Leung	Signature:	\-lem	y don	Date:	9-Feb-23

# **High-Volume TSP Sampler**

#### 5-POINT CALIBRATION DATA SHEET



File No. MA16034/05/0041

Project No.	AM1 - Tin Hau	ı Temple				<u>.</u>	
Date:	12-A	Apr-23	Next Due Date:	13-	Jun-23	Operator:	SK
Equipment No.:	t No.: A-01-05		Model No.:	GS	GS2310		10599
			Ambient C	ondition			
Temperatur	re. Ta (K)	298	Pressure, Pa			759.3	
Tomporatu	10, 10 (11)		11055410,14	(1111111128)		, 6516	
		Or	ifice Transfer Sta	ndard Informa	ation		
Serial	No.	3864	Slope, mc	0.05928	Intercept		-0.03491
Last Calibra	ntion Date:	16-Jan-23					
Next Calibra	ation Date:	16-Jan-24		$\mathbf{Qstd} = \{ [\Delta \mathbf{H} \ \mathbf{x} ] \}$	(Pa/760) x (298/	Γa)] <sup>1/2</sup> -bc} / m	ıc
			Calibration of	TSP Sampler	T		
Calibration	ATT ( 10' )	Oı	fice	Lo. 1 (GT) 6		HVS	-0. (000 = 1.71/2
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	50) x (298/Ta)] <sup>1/2</sup>	Qstd (CFM) X - axis	ΔW (HVS), in. of water		50) x (298/Ta)] <sup>1/2</sup> <b>'-axis</b>
1	13.2		3.63	61.85	9.9		3.14
2	10.3		3.21	54.70	7.3		2.70
3	7.5		2.74	46.77	5.4		2.32
4	5.6		2.37	40.49	3.4		1.84
5	3.2		1.79	30.75	1.8		1.34
By Linear Regr	ession of V on	<b>X</b>					
Slope, mw =	0.0583	21		Intercent, bw :	-0.463	39	
<del>-</del> '	coefficient* =	_ 0	.9982				
		90, check and red		_			
		•					
			Set Point C	alculation			
From the TSP Fi	eld Calibration	Curve, take Qstd	= 43 CFM				
From the Regres	sion Equation, t	he "Y" value acc	ording to				
			$\mathbf{0std} + \mathbf{bw} = [\Delta \mathbf{W} \ \mathbf{x}]$	· (Do/740) (20	no //r <sub>a</sub> \1 <sup>1/2</sup>		
		mw x Q	$\mathbf{y}\mathbf{s}\mathbf{t}\mathbf{d} + \mathbf{D}\mathbf{w} = \mathbf{L}\mathbf{\Delta}\mathbf{w}\mathbf{x}$	(Pa//00) X (2)	96/14)]		
Therefore, Se	et Point; W = ( n	nw x Qstd + bw)	<sup>2</sup> x ( 760 / Pa ) x ( '	Ta / 298) =	4.18		
Remarks:							
Remarks.							
ā 1	***	1. 77	~.	X	<b>)</b>	<b>T</b>	10 4 22
Conducted by:	Wong S	hing Kwai	Signature:			Date:	12-Apr-23
Ch a d- 11	TT.	. T	C'	1-Pa	Mor	Data	10. 4 22
Checked by:	Henry	Leung	Signature:	1 cem		Date:	12-Apr-23

# **High-Volume TSP Sampler** 5-POINT CALIBRATION DATA SHEET



File No. MA16034/08/0040

Project No.	AM2 - Sai Tso	Wan Recreation	Ground				
Date:	9-F	eb-23	Next Due Date:	12-	12-Apr-23		SK
Equipment No.:	A-(	)1-08	Model No.:	G	S2310	Serial No.	1287
			Ambient C	Condition			
Temperatur	re, Ta (K)	292.5	Pressure, Pa	(mmHg)		762.3	
		0	re on e cu	1 17 6			
Serial	No	3864	Slope, mc	0.05928	Intercept	. hc	-0.03491
Last Calibra		16-Jan-23			$c = [\Delta H \times (Pa/760)]$		
Next Calibra		16-Jan-24			$(Pa/760) \times (298/7)$		
TVCAL CUITOTE	ttion Dute.	10 3411 24		Z. ([=====	(1 44 / 00) 11 (2) 0/ 3	,,	
		<u>.                                    </u>	Calibration of	TSP Sampler			
G 111 .		Or	fice	101 Sumplet		HVS	
Calibration Point	ΔH (orifice), in. of water		(0) x (298/Ta)] <sup>1/2</sup>	Qstd (CFM) X - axis	ΔW (HVS), in. of water	[ΔW x (Pa/7	60) x (298/Ta)] <sup>1/2</sup> Y-axis
1	13.6		3.73	63.48	9.7		3.15
2	10.8		3.32	56.63	7.2		2.71
3	8.0		2.86	48.82	5.5		2.37
4	5.6		2.39	40.94	3.8		1.97
5	3.4		1.86	32.03	2.3		1.53
By Linear Regrees Slope, mw = Correlation of	ession of Y on 0.0505 coefficient* =	_	.9986	Intercept, bw =	-0.094	9	
*If Correlation C	oefficient < 0.9	90, check and rec	calibrate.				
			Set Point C	alculation			
From the TSP Fi	eld Calibration	Curve, take Qstd	= 43 CFM				
From the Regress	sion Equation, t	he "Y" value acco	ording to				
			$\mathbf{pstd} + \mathbf{bw} = [\Delta \mathbf{W}] \mathbf{x}$	- (D- /7(0) (2(	00/TD-\11/2		
		mw x C	$\sum_{i} \mathbf{S}(\mathbf{u} + \mathbf{D}\mathbf{w}) = [\mathbf{\Delta}\mathbf{w}] \mathbf{x}$	(Pa//00) X (2)	98/1a)j		
Therefore, Se	et Point; W = ( r	nw x Qstd + bw)	<sup>2</sup> x ( 760 / Pa ) x ( ′	Γa / 298 ) =	4.22		
Remarks:							
Conducted by:	Wong S	hing Kwai	Signature:	K	<b>J</b> .	Date:	9-Feb-23
Checked by:	Henry	/ Leung	Signature:	\-lem	y Xoz	Date:	9-Feb-23

# **High-Volume TSP Sampler** 5-POINT CALIBRATION DATA SHEET



File No. MA16034/08/0041

Project No.	AM2 - Sai Tso	Wan Recreation	Ground				
Date:	12-Apr-23		Next Due Date:	13	13-Jun-23		SK
Equipment No.:	A-(	)1-08	Model No.:	el No.: GS2310		Serial No.	1287
				****			
_			Ambient C				
Temperatur	e, Ta (K)	298	Pressure, Pa	(mmHg)		759.3	
		Or	ifice Transfer Star	ndard Informa	ation		
Serial	No.	3864	Slope, mc	0.05928	Intercept	, bc	-0.03491
Last Calibration Date: 16-Jan-23			n	nc x Qstd + bo	$c = [\Delta H \times (Pa/760)]$	) x (298/Ta)] <sup>1/2</sup>	:
Next Calibration Date: 16-Jan-24 $\mathbf{Qstd} = \{ [\Delta \mathbf{H} \times (\mathbf{Pa/760}) \times (298) \} \}$				(Pa/760) x (298/7	[a)] <sup>1/2</sup> -bc} / mo	e	
			Calibration of T	TSP Sampler			
Calibration		Oı	fice			HVS	1/2
Point	$\Delta H$ (orifice), in. of water	[ΔH x (Pa/76	60) x (298/Ta)] <sup>1/2</sup>	Qstd (CFM) <b>X - axis</b>	$\Delta$ W (HVS), in. of water		(0) x (298/Ta)] <sup>1/2</sup> -axis
1	13.5		3.67	62.54	9.5	3	3.08
2	10.6		3.25	55.49	7.0	2	2.64
3	7.8		2.79	47.68	5.3	2	2.30
4	5.4		2.32	39.77	3.7	1	1.92
5	3.2		1.79	30.75	2.1	1	1.45
By Linear Regr	ession of Y on	X					
Slope , mw =	0.0502	_	I	ntercept, bw =	-0.094	0	
Correlation of	coefficient* =	0	.9988				
*If Correlation C	oefficient < 0.9	90, check and rec	calibrate.				
			Set Point Ca	lculation			
From the TSP Fi	eld Calibration	Curve, take Qstd	= 43 CFM				
From the Regress	sion Equation, t	he "Y" value acc	ording to				
				(D. 15(0)) (2)	20 m > 1/2		
		mw x (	$\mathbf{Qstd} + \mathbf{bw} = [\Delta \mathbf{W} \ \mathbf{x}]$	(Pa//60) x (29	98/Ta)]***		
Therefore, Se	et Point; W = ( r	nw x Qstd + bw)	<sup>2</sup> x ( 760 / Pa ) x ( T	Ta / 298) =	4.27		
				•			
Remarks:							
Kemarks.							
					1		
Conducted by:	Wong	hing Kwai	Signature:	X7	J/ -	Date:	12-Apr-23
Conducted by:	wong S	inng Kwai	Signature:	1	<i>)</i>	Date:	12-Apt-23
Checked by:	Henry	/ Leung	Signature:	-lem	, Don	Date:	12-Apr-23

# **High-Volume TSP Sampler**

#### 5-POINT CALIBRATION DATA SHEET



File No. MA16034/03/0040

SK
ρIZ
10379
0.03491
(298/Ta)] <sup>1/2</sup>
(296/1a)] S
-Feb-23
-Feb-23

# **High-Volume TSP Sampler**

#### 5-POINT CALIBRATION DATA SHEET



File No. MA16034/03/0041

Project No.	AM3 - Yau Lai	Estate, Bik Lai I	House				
Date:	12-A	Apr-23	Next Due Date:	12-	Jun-23	Operator:	SK
Equipment No.:	A-0	01-03	Model No.:	GS	S2310	Serial No.	10379
			Ambient C	ondition			
Temperatur	re Ta(K)	298	Pressure, Pa			759.3	
Temperatur	ic, 1a (it)	270	r ressure, r a	(IIIIII Ig)		137.3	
		Or	ifice Transfer Sta	ndard Informa	ation		
Serial	No.	3864	Slope, mc	0.05928	Intercept		-0.03491
Last Calibra	ntion Date:	16-Jan-23 $mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$					
Next Calibra	ation Date:	16-Jan-24	(	$Qstd = \{ [\Delta H \ x] $	(Pa/760) x (298/7	Γa)] <sup>1/2</sup> -bc} / m	c
			Calibration of	TSP Sampler			
Calibration	AII (anifina)		fice	O + 1 (CEM)	AW (HVG)	HVS	(200 /F )1 <sup>1/2</sup>
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	50) x (298/Ta)] <sup>1/2</sup>	Qstd (CFM) X - axis	$\Delta$ W (HVS), in. of water		50) x (298/Ta)] <sup>1/2</sup> -axis
1	13.1		3.62	61.62	9.0		3.00
2	10.3		3.21	54.70	6.7		2.59
3	8.2		2.86	48.87	5.1		2.26
4	5.2		2.28	39.04	3.2		1.79
5	2.9		1.70	29.30	1.9		1.38
	0.0499 coefficient* =	0	.9973	Intercept, bw :	-0.131	1	
*If Correlation C	Coefficient < 0.9	90, check and red	calibrate.				
			Set Point Ca	alculation			
From the TSP Fi	eld Calibration	Curve, take Qstd	= 43 CFM				
From the Regress	sion Equation, t	he "Y" value acco	ording to				
			$\mathbf{0std} + \mathbf{bw} = [\Delta \mathbf{W} \ \mathbf{x}]$	· (Da/740) (20	no //r <sub>a</sub> \1 <sup>1/2</sup>		
		IIIW X Q	$y_{S}(\mathbf{u} + \mathbf{D}\mathbf{w} = \mathbf{L}\Delta\mathbf{w}) \mathbf{x}$	. (Fa//00) X (2)	90/1a)j		
Therefore, Se	et Point; W = ( n	nw x Qstd + bw)	<sup>2</sup> x ( 760 / Pa ) x ( ′	$\Gamma a / 298) =$	4.07	_	
Remarks:							
				. 1 -	. 1		
Conducted by:	Wong Sl	ning Kwai	Signature:		<u> </u>	Date:	12-Apr-23
Checked by:	Henry	Leung	Signature:	\-lem	y day	Date:	12-Apr-23

### **High-Volume TSP Sampler** 5-POINT CALIBRATION DATA SHEET



File No. MA20003/55/018 CKL 2 - Flat 103 Cha Kwo Ling Village Project No. 4-Mar-23 Next Due Date: 4-May-23 Operator: SK Date: Equipment No.: A-01-55 Model No.: TE 5170 Serial No. 1956 **Ambient Condition** 292.6 Temperature, Ta (K) Pressure, Pa (mmHg) 768.4 **Orifice Transfer Standard Information** 0.05928 Intercept, bc 3864 Slope, mc -0.03491 Serial No. mc x Qstd + bc =  $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ 16-Jan-23 Last Calibration Date: Qstd =  $\{ [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} -bc \} / mc$ 16-Jan-24 Next Calibration Date: **Calibration of TSP Sampler** Orfice HVS Calibration  $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$  $\Delta H$  (orifice), Ostd (CFM)  $\Delta W$  (HVS), in.  $[\Delta H \ x \ (Pa/760) \ x \ (298/Ta)]^{1/2}$ Point in. of water X - axis of water Y-axis 1 13.2 3.69 62.78 10.4 3.27 8.4 2.94 2 11.0 3.37 57.36 8.8 3.01 51.37 2.57 4 5.4 2.36 40.37 3.2 1.82 5 3.0 1.8 1.76 30.24 1.36 By Linear Regression of Y on X Slope, mw = 0.0600Intercept, bw = -0.5162 Correlation coefficient\* = \*If Correlation Coefficient < 0.990, check and recalibrate. **Set Point Calculation** From the TSP Field Calibration Curve, take Qstd = 43 CFM From the Regression Equation, the "Y" value according to mw x Qstd + bw =  $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Therefore, Set Point; W =  $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ Remarks: Conducted by: Wong Shing Kwai Checked by: Henry Leung

Rm 1904, Technology Park 18 On Lai Street, Shatin

NT, Hong Kong

Tel: +852 3841 4388 Website: https://www.hpct.com.hk



Report No. : 00319 Issue Date : 06 Jan 2023

Application No. : HP00222

**Certificate of Calibration** 

Applicant : Cinotech Consultants Limited

RM 1710, Technology Park,

18 On Lai Street,

Shatin, N.T., Hong Kong

Sample Description : Submitted equipment stated to be Integrating Sound Level Meter.

Equipment No.: : N-08-07

Manufacturer: : SVANTEK

Other information : Model No. SVAN 957

Serial No. 21455
Microphone No. 17204

Date Received : 06 Jan 2023

Test Period : 06 Jan 2023 to 06 Jan 2023

Test Requested : Performance checking for Sound Level Meter

Test Method : The Sound Level Calibrator has been calibrated in accordance with the

documented procedures and using standard and instrument which are

recommended by the manufacturer, or equivalent.

Test conditions : Room Temperature: 22-25 degree Celsius

Relative Humidity: 35-70%

Test Result : Refer to the test result(s) on page 2.

Remark: 1. Information of the sample description provided by the Applicant.

2. The result(s) relate only to the items tested or calibrated.

For and on behalf of HIGH PRECISION CHEMICAL TESTING LIMITED

Lee Wai Kit Laboratory Manager

Rm 1904, Technology Park 18 On Lai Street, Shatin

NT, Hong Kong

Tel: +852 3841 4388 Website: https://www.hpct.com.hk



Application No. : HP00222

# **Certificate of Calibration**

Measuring equipment

Description	Sound Calibrator
Manufacturer	Brüel & Kjær
Model No.	TYPE 4231
Serial No.	2326353
Equipment No.	N-02-01

Test Result

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB	
94.0	95.0	± 1.0	± 1.5	
114.0	114.4	+ 0.4	± 1.5	

Note

- : 1. "Instrument Readings" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.
  - 2. The indication value was obtained from the average of ten replicated measurement.

- End of report -

Rm 1904, Technology Park 18 On Lai Street, Shatin

NT, Hong Kong

Tel: +852 3841 4388 Website: https://www.hpct.com.hk



Report No. : 00333 Issue Date : 20 Jan 2023

Application No. : HP00212

**Certificate of Calibration** 

Applicant : Cinotech Consultants Limited

RM 1710, Technology Park,

18 On Lai Street,

Shatin, N.T., Hong Kong

Sample Description : Submitted equipment stated to be Integrating Sound Level Meter.

Equipment No.: : N-12-02

Manufacturer: : BSWA Technology

Other information : | |

Model No.	BSWA 308
Serial No.	570187
Microphone No.	590079

Date Received : 18 Jan 2023

Test Period : 20 Jan 2023 to 20 Jan 2023

Test Requested : Performance checking for Sound Level Meter

Test Method : The Sound Level Calibrator has been calibrated in accordance with the

documented procedures and using standard and instrument which are

recommended by the manufacturer, or equivalent.

Test conditions : Room Temperature: 22-25 degree Celsius

Relative Humidity: 35-70%

Test Result : Refer to the test result(s) on page 2.

Remark: 1. Information of the sample description provided by the Applicant.

2. The result(s) relate only to the items tested or calibrated.

For and on behalf of HIGH PRECISION CHEMICAL TESTING LIMITED

Lee Wai Kit Laboratory Manager

Rm 1904, Technology Park 18 On Lai Street, Shatin

NT, Hong Kong

Tel: +852 3841 4388 Website: https://www.hpct.com.hk



Report No. : 00333 | Issue Date : 20 Jan 2023

Application No. : HP00212

# **Certificate of Calibration**

Measuring equipment

Description	Sound Calibrator		
Manufacturer	Brüel & Kjær		
Model No.	TYPE 4231		
Serial No.	2326353		
Equipment No.	N-02-01		

Test Result

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	94.0	± 0.0	± 1.5
114.0	114.2	+ 0.2	± 1.5

Note

- : 1. "Instrument Readings" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.
  - 2. The indication value was obtained from the average of ten replicated measurement.

- End of report -

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NT, Hong Kong

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Report No. : 00361 | Issue Date : 30 Mar 2023

Application No. : HP00236

**Certificate of Calibration** 

Applicant : Cinotech Consultants Limited

RM 1710, Technology Park,

18 On Lai Street,

Shatin, N.T., Hong Kong

Sample Description : Submitted equipment stated to be Integrating Sound Level Meter.

Equipment No.: : N-12-04

Manufacturer: : BSWA Technology

Other information : N

Model No.	BSWA 308
Serial No.	580238
Microphone No.	570605

Date Received : 27 Mar 2023

Test Period : 28 Mar 2023 to 28 Mar 2023

Test Requested : Performance checking for Sound Level Meter

Test Method : The Sound Level Calibrator has been calibrated in accordance with the

documented procedures and using standard and instrument which are

recommended by the manufacturer, or equivalent.

Test conditions : Room Temperature: 22-25 degree Celsius

Relative Humidity: 35-70%

Test Result : Refer to the test result(s) on page 2.

Remark: 1. Information of the sample description provided by the Applicant.

2. The result(s) relate only to the items tested or calibrated.

For and on behalf of HIGH PRECISION CHEMICAL TESTING LIMITED

Lee Wai Kit Laboratory Manager

Rm 1904, Technology Park 18 On Lai Street, Shatin

NT, Hong Kong

Tel: +852 3841 4388 Website: https://www.hpct.com.hk



Report No. : 00361 Issue Date : 30 Mar 2023

Application No. : HP00236

# **Certificate of Calibration**

Measuring equipment

Description	Sound Calibrator
Manufacturer	Brüel & Kjær
Model No.	TYPE 4231
Serial No.	2326353
Equipment No.	N-02-01

Test Result

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	94.2	+ 0.2	± 1.5
114.0	114.3	+ 0.3	± 1.5

Note

- : 1. "Instrument Readings" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.
  - 2. The indication value was obtained from the average of ten replicated measurement.

- End of report -

Rm 1904, Technology Park 18 On Lai Street, Shatin

NT, Hong Kong

Tel: +852 3841 4388 Website: https://www.hpct.com.hk



Report No. : 00364 | Issue Date : 03 Apr 2023

Application No. : HP00240

**Certificate of Calibration** 

Applicant : Cinotech Consultants Limited

RM 1710, Technology Park,

18 On Lai Street,

Shatin, N.T., Hong Kong

Sample Description : Submitted equipment stated to be Integrating Sound Level Meter.

Equipment No.: : N-12-05

Manufacturer: : BSWA Technology

Other information :

Model No.	BSWA 308
Serial No.	580287
Microphone No.	570610

Date Received : 03 Apr 2023

Test Period : 03 Apr 2023 to 03 Apr 2023

Test Requested : Performance checking for Sound Level Meter

Test Method : The Sound Level Calibrator has been calibrated in accordance with the

documented procedures and using standard and instrument which are

recommended by the manufacturer, or equivalent.

Test conditions : Room Temperature: 22-25 degree Celsius

Relative Humidity: 35-70%

Test Result : Refer to the test result(s) on page 2.

Remark: 1. Information of the sample description provided by the Applicant.

2. The result(s) relate only to the items tested or calibrated.

For and on behalf of HIGH PRECISION CHEMICAL TESTING LIMITED

Lee Wai Kit Laboratory Manager

Rm 1904, Technology Park 18 On Lai Street, Shatin

NT, Hong Kong

Tel: +852 3841 4388 Website: https://www.hpct.com.hk

:



Report No. : 00364 | Issue Date : 03 Apr 2023

Application No. : HP00240

# **Certificate of Calibration**

Measuring equipment

Description	Sound Calibrator
Manufacturer	Brüel & Kjær
Model No.	TYPE 4231
Serial No.	2326353
Equipment No.	N-02-01

Test Result

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	94.2	+ 0.2	± 1.5
114.0	114.2	+ 0.2	± 1.5

Note

- : 1. "Instrument Readings" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.
  - 2. The indication value was obtained from the average of ten replicated measurement.

- End of report -

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NT, Hong Kong

Tel: +852 3841 4388 Website: https://www.hpct.com.hk



Report No. : 00288 Issue Date : 10 Nov 2022

Application No. : HP00176

**Certificate of Calibration** 

Applicant : Cinotech Consultants Limited

RM 1710, Technology Park,

18 On Lai Street,

Shatin, N.T., Hong Kong

Sample Description : Submitted equipment stated to be Sound Level Calibrator.

Equipment No.: : N-13-03

Manufacturer: : SOUNDTEK

Other information : Model No. ST-120

Serial No. 181001637

Date Received : 10 Nov 2022

Test Period : 10 Nov 2022 to 10 Nov 2022

Test Requested : Performance checking for Sound Level Calibrator

Test Method : The Sound Level Meter and Calibrator has been calibrated in accordance with

the documented procedures and using standard and instrument which are

recommended by the manufacturer, or equivalent.

Test conditions : Room Temperature: 22-25 degree Celsius

Relative Humidity: 35-70%

Test Result : Refer to the test result(s) on page 2.

Remark : 1. Information of the sample description provided by the Applicant.

2. The result(s) relate only to the items tested or calibrated.

For and on behalf of HIGH PRECISION CHEMICAL TESTING LIMITED

Lee Wai Kit Laboratory Manager

Rm 1904, Technology Park 18 On Lai Street, Shatin

NT, Hong Kong

Tel: +852 3841 4388 Website: https://www.hpct.com.hk



Report No. : 00288 | Issue Date : 10 Nov 2022

Application No. : HP00176

# **Certificate of Calibration**

Measuring equipment

Description	Sound Calibrator
Manufacturer	Brüel & Kjær
Model No.	TYPE 4231
Serial No.	2326353
Equipment No.	N-02-01

Description	Sound Meter
Manufacturer	BSWA Technology
Model No.	BSWA 308
Serial No.	570183
Microphone No.	570605
Equipment No.	N-12-01

Test Result

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	94.1	+ 0.1	± 0.3
114.0	114.2	+ 0.2	± 0.5

Note

- : 1. "Instrument Readings" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.
  - 2. The indication value was obtained from the average of ten replicated measurement.

- End of report -



#### **Certificate of Calibration**

_					
It ۱	is certified that the item	ı under calibration	i has been calibrated b	ov corresponding cal	ibrated High Volume Sample

Description:	Laser Dust Mo	nitor			Date o	f Calibration	31-Mar-23
Manufacturer:	Sibata Scientif	ic Technology I	LTD.		Validity of Calibra	tion Record	31-May-23
Model No.:	LD-3B						
Serial No.:	2Y6194						
Equipment No.:	SA-01-02			Sensitivity	0.001 mg/m3		
High Volume Sa	ampler No.:	A-01-03		Before Sensi	tivity Adjustment	578	
Tisch Calibratio	n Orifice No.:	3864		After Sensiti	vity Adjustment	578	
			Calibrat	ion of 1 hr T	SP		
Calibration		Laser Dust	t Monitor			HVS	
Point	Total Count	(	Count / Minute X-axis		Mass	concentration (µ <b>Y-axis</b>	ug/m³)
1	4080		72.0			137.0	
2	3600		63.0			119.0	
3	2880		52.0			98.0	
Avei	rage		62.3			118.0	
By Linear Regr Slope , mw = Correl	ression of Y on  1.94  ation coefficien	85	0.999		rcept, bw =	-3.4568	3
Set Correlation l SCF = [ K=Hig		pler / Dust Met	ter, ( μ g/m3) ]		1.9		
In-house method The Dust Monito (CF) between the Those filter pap	or was compared e Dust Monitor	l with a calibrat and High Volun	ed High Volum ne Sampler.	•	d The result was used	to generate the	Correlation Factor
Calibrated by:	cal Officer (Wo	ng Shing Kwai)			Approved by: _	Project Manager	(Henry Leung)



#### **Certificate of Calibration**

Description:	Digital Dust Indicator		Date of Calibration	31-Mar-23
Manufacturer:	Sibata Scientific Technology LTD.	_	Validity of Calibration Record	31-May-23
Model No.:	LD-5R			
Serial No.:	8Y2374			
Equipment No.:	SA-01-04	Sensitivity	0.001 mg/m3	
High Volume Sa	ampler No.: A-01-03	Before Sensi	ivity Adjustment 652	
Tisch Calibratio	n Orifice No.: 3864	After Sensitiv	vity Adjustment 652	
	Ca	libration of 1	hr TSP	
Calibration	Laser Dust Monitor		HVS	
Point	Mass Concentration (μg/ <b>X-axis</b>	/m3)	Mass concentration  Y-axis	(μg/m <sup>3</sup> )
1	71.0		132.0	
2	64.0		119.0	
3	53.0		98.0	
Average	62.7		116.3	
Slope , mw = Correlation co			-2.149	<u>8                                    </u>
	Se	et Correlation	Factor	
	ncentration by High Volume Sampler	$(\mu g/m^3)$	116.3	
	ncentration by Dust Meter (µg/m³)		62.7	
Measureing time			60.0	
Set Correlation I SCF = [ K=Hig	ractor , SCF h Volume Sampler / Dust Meter, (µ	ıg/m3) ]	1.9	
In-house method	d in according to the instruction manu	ıal:		
Factor (CF) betw	or was compared with a calibrated Hi ween the Dust Monitor and High Volu pers are weighted by HOKLAS lab	ime Sampler.	•	erate the Correlation
Calibrated by: Technic	:al Officer (Wong Shing Kwai)	_	Approved by:Project Manager (Hen	ry Leung)



#### **Certificate of Calibration**

Description:	Digital Dust I	ndicator		Date of	f Calibration	31-Mar-23
Manufacturer:	Sibata Scienti	fic Technology LTD.	_	Validity of Calibra	ation Record	31-May-23
Model No.:	LD-5R					
Serial No.:	8Y2373					
Equipment No.:	SA-01-05		Sensitivity	0.001 mg/m3		
High Volume Sa	mpler No.:	A-01-03	Before Sensiti	vity Adjustment	657	
Tisch Calibration	n Orifice No.:	3864	After Sensitivi	ty Adjustment	657	
		Cal	libration of 1 h	r TSP		
Calibration		<b>Laser Dust Monitor</b>			HVS	
Point	M	ass Concentration (μg/1 <b>X-axis</b>	m3)	Mass	s concentration (μ <b>Y-axis</b>	ug/m <sup>3</sup> )
1		72.0			133.0	
2		63.0			113.0	
3		53.0			98.0	
Average		62.7			114.7	
By Linear Regr			<b>-</b> .	. •	0.2764	
	1.835	0.9937		cept, bw =	-0.3764	
Slope , mw = Correlation co	1.833 pefficient* =	0.9937 Set	t Correlation F			
Slope , mw = Correlation co	1.835 pefficient* =	0.9937  Set High Volume Sampler (	t Correlation F		114.7	
Slope , mw = Correlation co	1.835 pefficient* =	0.9937 Set	t Correlation F			
Slope , mw = Correlation co  Particaulate Con Particaulate Con	1.835 pefficient* = centration by I centration centration centralises centralise	0.9937  Set High Volume Sampler (	t Correlation F		114.7 62.7	
Slope , mw = Correlation co  Particaulate Con Particaulate Con Measureing time Set Correlation F	centration by I centration by	0.9937  Set High Volume Sampler (	t Correlation F (µg/m³)		114.7 62.7	
Slope , mw = Correlation co  Particaulate Con Particaulate Con Measureing time Set Correlation F SCF = [K=Higl  In-house method The Dust Monito Factor (CF) betw	centration by I centration by	58 0.9937 Set High Volume Sampler ( Dust Meter (μg/m³)	g/m3)   al: gh Volume Sam me Sampler.	1.8	114.7 62.7 60.0	rate the Correlation



#### **Certificate of Calibration**

Description:	Digital Dust Indicator	Date	Date of Calibration 31-Mar-2	
Manufacturer:	Sibata Scientific Technology LTD.	Validity of Calibi	Validity of Calibration Record	
Model No.:	LD-5R			
Serial No.:	972777			
Equipment No.:	SA-01-06	Sensitivity 0.001 mg/m3	_	
High Volume Sa	ampler No.: A-01-03	Before Sensitivity Adjustment	645	
Tisch Calibratio	on Orifice No.: 3864	After Sensitivity Adjustment	645	
	Ca	alibration of 1 hr TSP		
Calibration	Laser Dust Monito		HVS	
Point	Mass Concentration (μg	/m3) Mas	ss concentration (	$ug/m^3$ )
1	X-axis		Y-axis	
2	69.0 62.0		136.0 118.0	
3	51.0		100.0	
Average	60.7		118.0	
Correlation co		et Correlation Factor		
Particaulate Cor	ncentration by High Volume Sampler		118.0	
	ncentration by Dust Meter (µg/m³)	(19.11)	60.7	
Measureing time			60.0	
Set Correlation	Factor, SCF			
SCF = [ K=Hig	th Volume Sampler / Dust Meter, (µ	1.9 1.9		
The Dust Monit Factor (CF) bety	d in according to the instruction manu or was compared with a calibrated Hi ween the Dust Monitor and High Volu pers are weighted by HOKLAS lab	igh Volume Sampler and The result ume Sampler.	was used to gene	rate the Correlation
Calibrated by Technic	:	Approved by: Projec	Lement Manager (Henr	Leung)

Digital Dust Indicator



Date of Calibration 31-Mar-23

#### **Certificate of Calibration**

Description:

Manufacturer:	Sibata Scientific Tech	nology LTD.	_	Validity of Calibr	ration Record	31-May-23	
Model No.:	LD-5R						
Serial No.:	972778						
Equipment No.:	SA-01-07		Sensitivity	0.001 mg/m3	_		
High Volume Sa	mpler No.: A-01-0	3_	Before Sensitiv	vity Adjustment	735 CPM		
Tisch Calibratio	n Orifice No.: 3864	_	After Sensitivi	ty Adjustment	735 CPM		
		Cal	ibration of 1 h	r TSP			
Calibration	Laser	Dust Monitor			HVS		
Point	Mass Cone	centration (µg/1	m3)	Mas	ss concentration (µ	ug/m <sup>3</sup> )	
		X-axis			Y-axis		
1		66.0			135.0		
2		58.0			117.0		
3		47.0			96.0		
Average		57.0			116.0		
Slope , mw = Correlation co	2.0440 pefficient* =	0.9989 Set	Correlation F	ept, bw = actor	-0.5055		
Particaulate Con	centration by High Vol				116.0		
	centration by Dust Met				57.0		
Measureing time	, (min)				60.0		
Set Correlation 1	Factor, SCF						
SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)] 2.0							
In-house method in according to the instruction manual:							
	or was compared with a			oler and The result	was used to gene	rate the Correlation	
	veen the Dust Monitor	-	-	I :4: J)			
Those filter papers are weighted by HOKLAS laboratory (HPCT Litimed)							
Calibrated by:	al Officer (Wong Shing	Kwai)	-	Approved by: Projec	ct Manager (Henry	Leung)	

Digital Dust Indicator



Date of Calibration 31-Mar-23

#### **Certificate of Calibration**

Description:

Manufacturer:	Sibata Scientific Technology LTD.	_	Validity of Calibr	ration Record	31-May-23		
Model No.:	LD-5R						
Serial No.:	972779						
Equipment No.:	SA-01-08	Sensitivity	0.001 mg/m3	_			
High Volume Sa	ampler No.: A-01-03	Before Sensitiv	vity Adjustment	744 CPM			
Tisch Calibration	n Orifice No.: 3864	After Sensitivi	ty Adjustment	744 CPM			
	Ca	libration of 1 h	r TSP				
Calibration	Laser Dust Monitor	•		HVS			
Point	Mass Concentration (μg/	/m3)	Mas	ss concentration (µ	$g/m^3$ )		
	X-axis			Y-axis			
1	69.0			136.0			
2	58.0			117.0			
3	49.0			96.0			
Average	58.7			116.3			
Correlation co			ept, bw =	-0.4153	_		
Particaulate Con	centration by High Volume Sampler			116.3			
	centration by Dust Meter (µg/m³)			58.7			
Measureing time	e, (min)			60.0			
Set Correlation I	Factor, SCF						
SCF = [ K=Hig	SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)] 2.0						
In-house method in according to the instruction manual:							
	or was compared with a calibrated Hi		oler and The result	t was used to gene	rate the Correlation		
	ween the Dust Monitor and High Volu	-	T '4' I				
Those filter papers are weighted by HOKLAS laboratory (HPCT Litimed)							
Calibrated by:	al Officer (Wong Shing Kwai)	_	Approved by: Projec	et Manager (Henry	Leung)		

Digital Dust Indicator



31-Mar-23

Date of Calibration

#### **Certificate of Calibration**

Description:

Manufacturer:	Sibata Scient	ific Technology LTD.	_	Validity of Calibr	ration Record	31-May-23
Model No.:	LD-5R					
Serial No.:	972780					
Equipment No.:	SA-01-09		Sensitivity	0.001 mg/m3	_	
High Volume Sa	mpler No.:	A-01-03	Before Sensiti	vity Adjustment	739 CPM	
Tisch Calibration	n Orifice No.:	3864	After Sensitiv	ity Adjustment	739 CPM	
		Ca	libration of 1 h	r TSP		
Calibration		Laser Dust Monitor	•		HVS	
Point	N	Iass Concentration (μg/	m3)	Mas	ss concentration (	$\mu g/m^3$ )
1		X-axis			Y-axis	
2		71.0 61.0			138.0 118.0	
3		51.0			97.0	
Average		61.0			117.7	
Correlation co	oefficient* =	0.9999	t Correlation F	actor		
Particaulate Con	centration by	High Volume Sampler	2		117.7	
	-	Dust Meter (μg/m <sup>3</sup> )	XI & /	61.0		
Measureing time	e, (min)				60.0	
Set Correlation I	Factor, SCF					
SCF = [ K=Hig	h Volume Sar	mpler / Dust Meter, (μ	g/m3) ]	1.9		
The Dust Monitor Factor (CF) betw	or was compar veen the Dust	to the instruction manured with a calibrated Hig Monitor and High Volunted by HOKLAS laborated	gh Volume Sam ime Sampler.	-	t was used to gen	erate the Correlation
Calibrated by:		ong Shing Kwai)	-	Approved by: Projec	Ct Manager (Henr	Leung)

Digital Dust Indicator



Date of Calibration 31-Mar-23

#### **Certificate of Calibration**

Description:

Manufacturer:	Sibata Scientific Technology LTD.	_	Validity of Calibr	ration Record	31-May-23		
Model No.:	LD-5R						
Serial No.:	972781						
Equipment No.:	SA-01-10	Sensitivity	0.001 mg/m3	_			
High Volume Sa	impler No.: A-01-03	Before Sensitiv	vity Adjustment	734 CPM			
Tisch Calibratio	n Orifice No.: 3864	After Sensitivi	ty Adjustment	734 CPM			
	Ca	alibration of 1 h	r TSP				
Calibration	Laser Dust Monito	r		HVS			
Point	Mass Concentration (μg	/m3)	Mas	ss concentration (µ	g/m <sup>3</sup> )		
	X-axis			Y-axis			
1	72.0			134.0			
2	64.0			115.0			
3	52.0			95.0			
Average	62.7			114.7			
Correlation co			ept, bw =	-6.1316			
Particaulate Con	centration by High Volume Sampler			114.7			
	centration by Dust Meter (µg/m³)			62.7			
Measureing time	e, (min)			60.0			
Set Correlation 1	Factor, SCF						
SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)] 1.8							
In-house method in according to the instruction manual:							
The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.  Those filter papers are weighted by HOKLAS laboratory (HPCT Litimed)							
Calibrated by:	al Officer (Wong Shing Kwai)	_	Approved by: Projec	lem et Manager (Henry	Leung)		





# RECALIBRATION DUE DATE:

January 16, 2024

# Certificate of Calibration

**Calibration Certification Information** 

Cal. Date: January 16, 2023

Rootsmeter S/N: 438320

Ta: 293

°K

Operator: Jim Tisch
Calibration Model #:

TE-5025A Calibrator S/N: 3864

Pa: 749.0

mm Hg

ΔΗ Vol. Final ΔVol. ΔTime ΔΡ Vol. Init (in H2O) (m3)(min) (mm Hg) Run (m3)(m3)2.00 3.2 2 1.4440 1 6.4 4.00 2 3 4 1 1.0220 5.00 3 5 1 8.0 6 0.9100 5.50 4 8.8 7 8 1 0.8710 8.00 10 0.7210 12.8

	Data Tabulation					
Vstd	Qstd	$\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right) \left(\frac{Tstd}{Ta}\right)}$		Qa	√∆H(Ta/Pa)	
(m3)	(x-axis)	(y-axis)	Va	(x-axis)	(y-axis)	
0.9981	0.6912	1.4159	0.9957	0.6896	0.8845	
0.9938	0.9724	2.0024	0.9915	0.9701	1.2509	
0.9917	1.0898	2.2388	0.9893	1.0872	1.3985	
0.9906	1.1373	2.3480	0.9883	1.1346	1.4668	
0.9853	1.3665	2.8318	0.9829	1.3633	1.7690	
	m=	2.09452		m=	1.31155	
<b>QSTD</b>	b=	-0.03493	QA	b=	-0.02182	
	r=	0.99995		r=	0.99995	

Calculations					
Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	Va=	ΔVol((Pa-ΔP)/Pa)		
Qstd= Vstd/ΔTime		Qa=	= Va/ΔTime		
For subsequent flow rate calculations:					
Qstd=	$1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$	Qa=	$1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$		

	Standard Conditions					
Tstd:						
Pstd:	760 mm Hg					
	Key					
ΔH: calibrator manometer reading (in H2O)						
ΔP: rootsmeter manometer reading (mm Hg)						
Ta: actual absolute temperature (°K)						
Pa: actual barometric pressure (mm Hg)						
b: intercept						
m: slope						

#### RECALIBRATION

US EPA recommends annual recalibration per 1998
40 Code of Federal Regulations Part 50 to 51,
Appendix B to Part 50, Reference Method for the
Determination of Suspended Particulate Matter in
the Atmosphere, 9.2.17, page 30



#### **Certificate of Calibration - Wind Monitoring Station**

Description: Yau Lai Estate, Bik Lai House

Manufacturer: Davis Instruments

Model No.: <u>Davis7440</u>

Serial No.: MC01010A44

Equipment No.: <u>SA-03-04</u>

Date of Calibration <u>18-Feb-2023</u>

Next Due Date <u>18-Aug-2023</u>

#### 1. Performance check of Wind Speed

Wind Sp	peed, m/s	Difference D (m/s)
Wind Speed Reading (V1) Anemometer Value (V2)		D = V1 - V2
0.0	0.0	0.0
1.2	1.3	-0.1
2.5	2.5	0.0
3.8	3.9	-0.1

#### 2. Performance check of Wind Direction

Wind Di	rection (°)	Difference D (°)
Wind Direction Reading (W1) Marine Compass Value (W2)		D = W1 - W2
0	0	0.0
90	90	0.0
180	180	0.0
270	270	0.0

#### **Test Specification:**

- 1. Performance Wind Speed Test The wind meter was on-site calibrated against the anemometer
- 2. Performance Wind Direction Test The wind meter was on-site calibrated against the marine compass at four direction

Calibrated by: Approved by: Approved by: Henry/Leung