



Accredited Laboratory

A2LA has accredited

CAL LAB LIMITED

Tsuen Wan, NT, HONG KONG

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets R205 – Specific Requirements: Calibration Laboratory Accreditation Program. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).



Presented this 26th day of November 2025.

A blue ink signature of Mr. Trace McInturff.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3815.01
Valid to September 30, 2027

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.

Hong Kong Accreditation Service



[Home](#) > [Accreditation, Standards and Calibration Services: Hong Kong Accreditation Service](#) > [FAQ / Information](#)
> [Mutual Recognition Arrangements \(MRA\) / Multilateral Recognition Arrangements \(MLA\)](#)

FAQ / Information

Mutual Recognition Arrangements (MRA) / Multilateral Recognition Arrangements (MLA)

Mutual Recognition Arrangement (MRA) Partners for HOKLAS ^

Every effort is made to promote acceptance of test data from accredited laboratories, both internationally and locally. HKAS has concluded mutual recognition arrangements with accreditation bodies listed below by being one of the signatories of the [International Laboratory Accreditation Cooperation Mutual Recognition Arrangement \(ILAC MRA\)](#) and the [Asia Pacific Accreditation Cooperation Mutual Recognition Arrangement \(APAC MRA\)](#) for testing, calibration, medical testing, Proficiency Testing Providers (PTP) and Reference Material Producers (RMP). Click [here](#) to view the up-to-date signatories of ILAC and [here](#) to access the up-to-date signatories of APAC.

Visitors checking the names, logos and accreditation symbols shown on an endorsed certificate or report should note that some of our MRA partners may have their names, logos or accreditation symbols changed recently and test reports or certificates endorsed by displaying their old accreditation symbols may still be valid during the change-over period. For details, please visit their websites or contact them directly.

» [Mutual Recognition Arrangement \(MRA\) Partners for HOKLAS](#)

HKAS MRA partners will recognise HOKLAS endorsed test certificates as having the same technical validity as certificates endorsed by their respective schemes.

Hong Kong Accreditation Service

- [HKAS Home](#)
- [HKAS](#)
- [Accreditation Services](#)
- [Accredited Conformity Assessment Bodies](#)
- [Publications](#)
- [FAQ / Information](#)
 - [Frequently Asked Questions](#)
 - [Closer Economic Partnership Arrangement \(CEPA\)](#)
 - [Mutual Recognition Arrangements \(MRA\) / Multilateral Recognition Arrangements \(MLA\)](#)
 - [Becoming an Assessor](#)
 - [Testing of Lead, Cadmium, Chromium, Nickel, Antimony and Copper in Water](#)
 - [Useful Links](#)

Hong Kong Laboratory Accreditation Scheme (HOKLAS) - Mutual Recognition Arrangement (MRA) Partners

Economy	Logo	Name of Partner	URL	Test Area
Ukraine		National Accreditation Agency of Ukraine (NAAU)	http://www.naaau.org.ua/	Calibration, Medical Testing, Non-medical Testing
United Arab Emirates		Emirates International Accreditation Center (EIAC)	http://www.eiac.gov.ae/	Calibration, Medical Testing, Non-medical Testing, Proficiency Testing Provider
United Arab Emirates		Ministry of Industry and Advanced Technology - Emirates National Accreditation System (MoIAT - ENAS)		Calibration, Non-medical Testing
United Kingdom of Great Britain and Northern Ireland		United Kingdom Accreditation Service (UKAS)	http://www.ukas.com	Calibration, Medical Testing, Non-medical Testing, Proficiency Testing Provider, Reference Material Producer
United States of America		AIHA Laboratory Accreditation Programs, LLC (AIHA-LAP, LLC)	http://www.aihaaccreditedlabs.org/	Non-medical Testing
United States of America		American Association for Laboratory Accreditation (A2LA)	http://www.a2la.org	Calibration, Medical Testing, Non-medical Testing, Proficiency Testing Provider, Reference Material Producer



Cal Lab Limited 校正實驗室有限公司

Room 2103, Technology Plaza, 29-35 Sha Tsui Road,
Tsuen Wan, NT, Hong Kong

Tel: +852 25680106 Email: info@callab.com.hk

Fax: +852 30116194 Website: www.callab.com.hk

CERTIFICATE OF CALIBRATION

Applicant: Apex Testing & Certification Ltd. Address: Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK	Calibration Certificate No.	HV0082604
	Date of Receipt	30 March 2026
	Date of Calibration	1 April 2026
	Page	1 of 1

Item for Calibration

Description : 便携式粉尘检测仪

Manufacturer : 江苏灵熙电子有限公司

Model No. : LX-PM100

Serial No. : 800S6312208

Standard Equipment

Description : High Volume Sampler / Calibration Orifice

Manufacturer : Tisch Environmental, Inc.

Model No. : TE-5170 / TE-5025A

Serial No. : 3476 / 4088

Last Calibration : 23 October 2025 / 9 September 2025

Date	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration Standard Equipment (mg/m ³)	Concentration Calibrated Equipment (mg/m ³)
1 April 2026	10:13:00 AM	22.9	1004.4	0.046	0.046
1 April 2026	11:35:00 AM	22.9	1004.4	0.039	0.040
1 April 2026	12:49:00 PM	22.9	1004.4	0.031	0.029

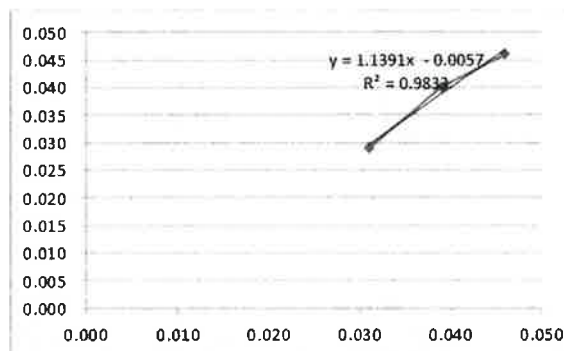
By Linear Regression of Y on X

Slope : 1.1391

Correlation Coefficient : 0.9833

K-Factor : 1.0147

Validity of Calibration : 31 March 2027



Calibrated By:

Wing Cheng

Checked and Approved By:

Warren Yeung

Company Chop:



Certificate Issue Date: 9 April 2026

CT-BEG-04

*** End of Certificate ***

1. The certificate shall not be reproduced except in full, without written approval of Cal Lab Limited
2. The certificate is issued subject to the latest Terms and Conditions, available at our web site



Cal Lab Limited 校正實驗室有限公司

Room 2103, Technology Plaza, 29-35 Sha Tsui Road,

Tsuen Wan, NT, Hong Kong

Tel: +852 25680106 Email: info@callab.com.hk

Fax: +852 30116194 Website: www.callab.com.hk

CERTIFICATE OF CALIBRATION

Applicant: Apex Testing & Certification Ltd. Address: Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK	Calibration Certificate No.	HV0212604
	Date of Receipt	30 March 2026
	Date of Calibration	1 April 2026
	Page	1 of 1

Item for Calibration

Description : 便携式粉尘检测仪

Manufacturer : 江苏灵熙电子有限公司

Model No. : LX-PM100

Serial No. : 800S6312221

Standard Equipment

Description : High Volume Sampler / Calibration Orifice

Manufacturer : Tisch Environmental, Inc.

Model No. : TE-5170 / TE-5025A

Serial No. : 3476 / 4088

Last Calibration : 23 October 2025 / 9 September 2025

Date	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration Standard Equipment (mg/m ³)	Concentration Calibrated Equipment (mg/m ³)
1 April 2026	10:13:00 AM	22.9	1004.4	0.046	0.048
1 April 2026	11:35:00 AM	22.9	1004.4	0.039	0.039
1 April 2026	12:49:00 PM	22.9	1004.4	0.031	0.030

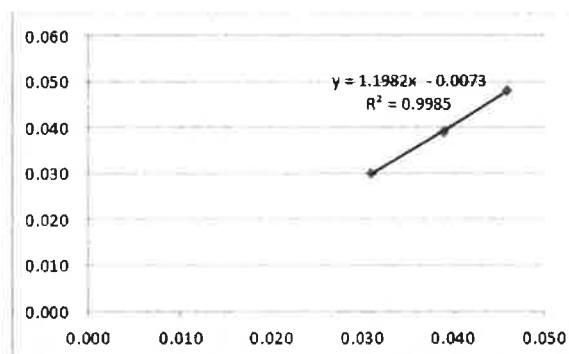
By Linear Regression of Y on X

Slope : 1.1982

Correlation Coefficient : 0.9985

K-Factor : 0.9972

Validity of Calibration : 31 March 2027



Calibrated By:

Wing Cheng

Checked and Approved By:

Warren Yeung

Company Chop:



Certificate Issue Date: 9 April 2026

CT-BEG-04

*** End of Certificate ***

1. The certificate shall not be reproduced except in full, without written approval of Cal Lab Limited
2. The certificate is issued subject to the latest Terms and Conditions, available at our web site



Cal Lab Limited 校正實驗室有限公司

Room 2103, Technology Plaza, 29-35 Sha Tsui Road,

Tsuen Wan, NT, Hong Kong

Tel: +852 25680106 Email: info@callab.com.hk

Fax: +852 30116194 Website: www.callab.com.hk

CERTIFICATE OF CALIBRATION

Applicant: Apex Testing & Certification Ltd. Address: Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK	Calibration Certificate No.	HV0332604
	Date of Receipt	30 March 2026
	Date of Calibration	1 April 2026
	Page	1 of 1

Item for Calibration

Description : 便携式粉尘检测仪

Manufacturer : 江苏灵熙电子有限公司

Model No. : LX-PM100

Serial No. : 800S6312233

Standard Equipment

Description : High Volume Sampler / Calibration Orifice

Manufacturer : Tisch Environmental, Inc.

Model No. : TE-5170 / TE-5025A

Serial No. : 3476 / 4088

Last Calibration : 23 October 2025/ 9 September 2025

Date	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration Standard Equipment (mg/m ³)	Concentration Calibrated Equipment (mg/m ³)
1 April 2026	10:13:00 AM	22.9	1004.4	0.046	0.045
1 April 2026	11:35:00 AM	22.9	1004.4	0.039	0.038
1 April 2026	12:49:00 PM	22.9	1004.4	0.031	0.030

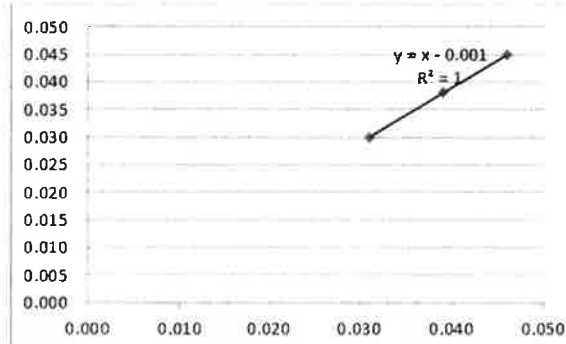
By Linear Regression of Y on X

Slope : 1.0000

Correlation Coefficient : 1.0000

K-Factor : 1.0273

Validity of Calibration : 31 March 2027



Calibrated By:


Wing Cheng

Checked and Approved By:


Warren Yeung

Company Chop:



Certificate Issue Date: 9 April 2026

CT-BEG-04

*** End of Certificate ***

1. The certificate shall not be reproduced except in full, without written approval of Cal Lab Limited
2. The certificate is issued subject to the latest Terms and Conditions, available at our web site



TE-5170 Calibration Worksheet

Site Information

Location: AM3A Site ID: Kowloon Cultural Date: 16-Apr-26
Sampler: TE-5170 Serial No: 4340 Tech: CS Tang

Site Conditions

Barometric Pressure (in Hg): 29.85 Corrected Pressure (mm Hg): 758
Temperature (deg F): 81 Temperature (deg K): 300
Average Press. (in Hg): 29.85 Corrected Average (mm Hg): 758
Average Temp. (deg F): 81 Average Temp. (deg K): 300

Calibration Orifice

Make: Tisch Qstd Slope: 2.11142
Model: TE-5025A Qstd Intercept: -0.03845
Serial#: 4088 Date Certified: 9-Sep-25

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	Linear Regression
1	12.60	1.692	53.0	52.76	Slope: 31.6268
2	10.70	1.560	48.0	47.78	Intercept: -0.8681
3	7.50	1.309	41.0	40.81	Corr. Coeff: 0.9976
4	4.60	1.029	33.0	32.85	
5	2.60	0.778	23.0	22.90	# of Observations: 5

Calculations

$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$
 $IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$

Qstd = standard flow rate
IC = corrected chart response
I = actual chart response

m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
 $1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure

Average I (chart): 40
Average Flow Calculation m3/min
1.273885088
Average Flow Calculation in CFM
44.98088246
Sample Time (Hrs): 1.0
Total Flow in m3/min
76.43310528
Total Flow in CFM
2698.852947

NOTE: Ensure calibration orifice has been certified within 12 months of use



TE-5170 Calibration Worksheet

Site Information

Location: AM4A Site ID: **Zones 2A at West** Date: **16-Apr-26**
Sampler: TE-5170 Serial No: **3998** Tech: **CS Tang**

Site Conditions

Barometric Pressure (in Hg): **29.85** Corrected Pressure (mm Hg): **758**
Temperature (deg F): **81** Temperature (deg K): **300**
Average Press. (in Hg): **29.85** Corrected Average (mm Hg): **758**
Average Temp. (deg F): **81** Average Temp. (deg K): **300**

Calibration Orifice

Make: **Tisch** Qstd Slope: **2.11142**
Model: **TE-5025A** Qstd Intercept: **-0.03845**
Serial#: **4088** Date Certified: **9-Sep-25**

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	Linear Regression
1	12.50	1.685	53.0	52.76	Slope: 30.1402
2	10.80	1.568	48.0	47.78	Intercept: 1.3771
3	7.60	1.318	41.0	40.81	Corr. Coeff: 0.9976
4	4.40	1.007	33.0	32.85	
5	2.30	0.733	23.0	22.90	# of Observations: 5

Calculations

$$Qstd = 1/m[\text{Sqrt}(H_2O(P_a/P_{std})(T_{std}/T_a))-b]$$
$$IC = I[\text{Sqrt}(P_a/P_{std})(T_{std}/T_a)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$$1/m((I) [\text{Sqrt}(298/T_a)(P_a/760)]-b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Average I (chart): **4.0**

Average Flow Calculation m3/min

1.26222125

Average Flow Calculation in CFM

44.56906323

Sample Time (Hrs): **1.0**

Total Flow in m3/min

75.7333275

Total Flow in CFM

2674.143794

NOTE: Ensure calibration orifice has been certified within 12 months of use



TE-5170 Calibration Worksheet

Site Information

Location: AM5A Site ID: **Zones 2A at West** Date: **16-Apr-26**
Sampler: TE-5170 Serial No: **4344** Tech: **CS Tang**

Site Conditions

Barometric Pressure (in Hg): **29.85** Corrected Pressure (mm Hg): **758**
Temperature (deg F): **81** Temperature (deg K): **300**
Average Press. (in Hg): **29.85** Corrected Average (mm Hg): **758**
Average Temp. (deg F): **81** Average Temp. (deg K): **300**

Calibration Orifice

Make: **Tisch** Qstd Slope: **2.11142**
Model: **TE-5025A** Qstd Intercept: **-0.03845**
Serial#: **4088** Date Certified: **9-Sep-25**

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	Linear Regression
1	12.60	1.692	53.0	52.76	Slope: 31.2568
2	10.50	1.546	48.0	47.78	Intercept: -0.2519
3	7.70	1.326	41.0	40.81	Corr. Coeff: 0.9979
4	4.50	1.018	33.0	32.85	
5	2.50	0.764	23.0	22.90	# of Observations: 5

Calculations

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Average I (chart): **40**

Average Flow Calculation m3/min

1.269246384

Average Flow Calculation in CFM

44.81708982

Sample Time (Hrs): **1.0**

Total Flow in m3/min

76.15478304

Total Flow in CFM

2689.025389

NOTE: Ensure calibration orifice has been certified within 12 months of use



TE-5170 Calibration Worksheet

Site Information

Location: AM3A Zones 2A at West Date: 12-Jun-26
Site ID: Kowloon Cultural
Sampler: TE-5170 Serial No: 4340 Tech: CS Tang

Site Conditions

Barometric Pressure (in Hg): 29.89 Corrected Pressure (mm Hg): 759
Temperature (deg F): 81 Temperature (deg K): 300
Average Press. (in Hg): 29.89 Corrected Average (mm Hg): 759
Average Temp. (deg F): 81 Average Temp. (deg K): 300

Calibration Orifice

Make: Tisch Qstd Slope: 2.11142
Model: TE-5025A Qstd Intercept: -0.03845
Serial#: 4088 Date Certified: 9-Sep-25

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	Linear Regression
1	12.70	1.698	53.0	52.76	Slope: 30.8034
2	10.50	1.546	48.0	47.78	Intercept: 0.6417
3	7.20	1.283	41.0	40.81	Corr. Coeff: 0.9982
4	4.50	1.018	33.0	32.85	
5	2.40	0.749	23.0	22.90	# of Observations: 5

Calculations

$$Qstd = 1/m[\text{Sqrt}(H_2O(P_a/P_{std})(T_{std}/T_a))-b]$$
$$IC = I[\text{Sqrt}(P_a/P_{std})(T_{std}/T_a)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$$1/m((I) [\text{Sqrt}(298/T_a)(P_a/760)]-b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Average I (chart): 40

Average Flow Calculation m3/min

1.258925955

Average Flow Calculation in CFM

44.45267547

Sample Time (Hrs): 1.0

Total Flow in m3/min

75.53555729

Total Flow in CFM

2667.160528

NOTE: Ensure calibration orifice has been certified within 12 months of use



TE-5170 Calibration Worksheet

Site Information

Location: AM4A Site ID: **Zones 2A at West** Date: 12-Jun-26
Sampler: TE-5170 Serial No: 3998 Tech: CS Tang

Site Conditions

Barometric Pressure (in Hg): 29.89 Corrected Pressure (mm Hg): 759
Temperature (deg F): 81 Temperature (deg K): 300
Average Press. (in Hg): 29.89 Corrected Average (mm Hg): 759
Average Temp. (deg F): 81 Average Temp. (deg K): 300

Calibration Orifice

Make: Tisch Qstd Slope: 2.11142
Model: TE-5025A Qstd Intercept: -0.03845
Serial#: 4088 Date Certified: 9-Sep-25

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	Linear Regression
1	12.80	1.705	53.0	52.76	Slope: 29.6922
2	10.70	1.560	48.0	47.78	Intercept: 1.9344
3	7.60	1.318	41.0	40.81	Corr. Coeff: 0.9975
4	4.30	0.996	33.0	32.85	
5	2.30	0.733	23.0	22.90	# of Observations: 5

Calculations

$$Qstd = 1/m[\text{Sqrt}(H_2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$$1/m((I) [\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Average I (chart): 40

Average Flow Calculation m3/min

1.262504588

Average Flow Calculation in CFM

44.57903699

Sample Time (Hrs): 1.0

Total Flow in m3/min

75.75027527

Total Flow in CFM

2674.74222

NOTE: Ensure calibration orifice has been certified within 12 months of use



TE-5170 Calibration Worksheet

Site Information

Location: AM5A Site ID: **Zones 2A at West** Date: 12-Jun-26
Sampler: TE-5170 Serial No: 4344 Tech: CS Tang

Site Conditions

Barometric Pressure (in Hg): 29.89 Corrected Pressure (mm Hg): 759
Temperature (deg F): 81 Temperature (deg K): 300
Average Press. (in Hg): 29.89 Corrected Average (mm Hg): 759
Average Temp. (deg F): 81 Average Temp. (deg K): 300

Calibration Orifice

Make: Tisch Qstd Slope: 2.11142
Model: TE-5025A Qstd Intercept: -0.03845
Serial#: 4088 Date Certified: 9-Sep-25

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	Linear Regression
1	12.70	1.698	53.0	52.76	Slope: 30.8169
2	10.80	1.568	48.0	47.78	Intercept: 0.2908
3	7.40	1.301	41.0	40.81	Corr. Coeff: 0.9972
4	4.50	1.018	33.0	32.85	
5	2.50	0.764	23.0	22.90	# of Observations: 5

Calculations

$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$
 $IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$1/m((I) [\text{Sqrt}(298/Tav)(Pav/760)]-b)$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Average I (chart): 40

Average Flow Calculation m3/min

1.269762568

Average Flow Calculation in CFM

44.83531627

Sample Time (Hrs): 1.0

Total Flow in m3/min

76.18575408

Total Flow in CFM

2690.118976

NOTE: Ensure calibration orifice has been certified within 12 months of use



Certificate of Calibration

Calibration Certification Information

Cal. Date: September 9, 2025 Rootsmeter S/N: 438320 Ta: 294 °K
Operator: Jim Tisch Pa: 754.9 mm Hg
Calibration Model #: TE-5025A Calibrator S/N: 4088

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4460	3.2	2.00
2	3	4	1	1.0320	6.4	4.00
3	5	6	1	0.9210	8.0	5.00
4	7	8	1	0.8840	8.8	5.50
5	9	10	1	0.7240	12.8	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (y-axis)
1.0025	0.6933	1.4190	0.9958	0.6886	0.8826
0.9983	0.9673	2.0068	0.9915	0.9608	1.2481
0.9961	1.0816	2.2436	0.9894	1.0743	1.3955
0.9951	1.1256	2.3532	0.9883	1.1180	1.4636
0.9897	1.3670	2.8380	0.9830	1.3578	1.7651
QSTD	m=	2.11142	QA	m=	1.32213
	b=	-0.03845		b=	-0.02391
	r=	0.99983		r=	0.99983

Calculations

Vstd=	$\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$	Va=	$\Delta Vol((Pa-\Delta P)/Pa)$
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= $1/m \left(\left(\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)} \right) - b \right)$	

Standard Conditions

Tstd: 298.15 °K

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



中国认可
国际互认
校准
CALIBRATION
CNAS L5102

华测计量检测有限公司

CTI MEASUREMENT AND TESTING CO., LTD.

校准证书

Calibration Certificate

证书编号

Certificate No.

C2509253990002

第 1 页 共 7 页

Page of

委托单位

Customer

上峰检测认证有限公司

委托单位地址

Address

香港荃湾海盛路3号TML广场10楼D6A室

器具名称

Name of instrument

声级计

型号规格

Model

AWA5661

制造商

Manufacturer

杭州爱华仪器有限公司

出厂编号

Serial No.

301135

管理编号

Management No.

接收日期

Received date

2025/09/26

校准日期

Calibration date

2025/09/27

发布日期

Issue date

2025/09/28

建议下次校准日期

Next calibration date

2026/09/26

批准

Approved by

曾财萍

曾财萍

审核

Inspected by

刘然

刘然

校准

Calibrated by

李少雄

李少雄



总部地址：广东省深圳市宝安区西乡街道铁岗社区桃花源科技创新园B、C栋

Headquarter address: Building B and C, Taohuayuan Sci-Tech Innovation Park, Tiegang Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, China

实验室地址：广东省深圳市宝安区西乡街道铁岗社区桃花源科技创新园B、C栋

Laboratory address: Building B and C, Taohuayuan Sci-Tech Innovation Park, Tiegang Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, China

邮编 Post code: 518101

电话 Tel.: 86-755-33682045

电子邮箱 E-mail: calibration@cti-cert.com

说明

Directions

证书编号 C2509253990002
Certificate No.

第 2 页 共 7 页
Page of

1. 本证书校准结果均可溯源至国际单位制 (SI) 单位。

The results are traceable to International System of Units(SI).

2. 证书未盖本公司证书/报告章及骑缝章无效。未经本公司书面批准, 不得部分复制此证书。

Any certificate is deemed to be invalid without both the certificate/report seal and its across-page seal. This certificate shall not be copied partly without the written approval.

3. 本证书校准结果只与受校准仪器有关。如证书中的英文内容与中文内容有差异, 以中文为准。

The results relate only to the items calibrated. In case of any discrepancy between the English version and Chinese version of the certificate(if generated), the Chinese version shall prevail.

4. 本次校准的技术依据:

Reference documents for the calibration

JJG 188-2017 声级计检定规程

5. 校准地点、环境条件:

Place and environment condition during calibration

地点: 本实验室力学室(6)

Place

温度: 22.3℃

Temperature

相对湿度: 52%

R.H.



计量溯源性声明

6. 本次校准所使用的主要计量标准器具:

Main measurement standards used in the calibration

名称/型号规格	编号	测量范围	准确度等级/最大允许误差/不确定度	证书号/溯源机构	有效期
Name/Model	Serial No.	Measurement range	Accuracy class/Maximum permissible error/Uncertainty	Certificate No./Traceability to	Due date
声校准器 4231	3014336	94dB~114dB	1级	SXE202510332 广东省计量科学研究院	2026/07/07
消音箱 AWA188	080312	10Hz~20kHz (20~130) dB	$U=0.8\text{dB}, k=2$	JL2411712691 深圳市计量质量检测研究院	2029/09/09
声频功率放大器 AWA5871	080649	/	$U=0.03\text{dB}, k=2$	SXE202501365 广东省计量科学研究院	2026/07/08
有源耦合腔 AWA6153S+	2006409	10Hz~400Hz	声压级: $U=0.2\text{dB}, k=2$ 失真度: $U=0.2\%, k=2$	SXE202483069 广东省计量科学研究院	2026/07/22
传声器 4192	2996596	1Hz~20000Hz	20Hz~4kHz: $U=0.20\text{dB}, k=2$; 5kHz~20kHz: $U=0.50\text{dB}, k=2$	SXE202501375 广东省计量科学研究院	2026/07/14
信号发生器 AWA1650	089943	0.5Hz~20kHz	电压: $U_{\text{rel}}=0.2\%, k=2$ 频率: $U_{\text{rel}}=0.1\%, k=2$	SXE202501364 广东省计量科学研究院	2026/07/08

说明

Directions

证书编号 C2509253990002
Certificate No.

第 3 页 共 7 页
Page of

名称/型号规格 Name/Model	编号 Serial No.	测量范围 Measurement range	准确度等级/最大允许误差/不确定度 Accuracy class/Maximum permissible error/Uncertainty	证书号/溯源机构 Certificate No./Traceability to	有效期 Due date
测试声源(扬声器) AWA5511A	090677	20Hz~20kHz	最大声压级: $U=0.6\text{dB}, k=2$ 声源稳定性: $U=0.6\text{dB}, k=2$ 总失真: $U_{\text{rel}}=2.7\%, k=2$ 频率响应: $U=0.6\text{dB}, k=2$	SXE202501372 广东省计量科学研究院	2026/07/14
测量放大器 AWA5810D	089909	4Hz~20kHz	灵敏度: $U=0.04\text{dB}, k=2$ 频率计权: $U=0.2\text{dB}, k=2$ 线性计权: 4Hz ~ 10Hz: $U=0.11\text{dB}, k=2$ 10Hz ~ 20kHz: $U=0.04\text{dB}, k=2$	SXE202583084 广东省计量科学研究院	2026/07/10
信号发生器(碎发音发生器) AWA1650	089943	10Hz~20kHz	时间: (0.1~10) ms: $U_{\text{rel}}=0.36\%, k=2$ (> 10~200) ms: $U_{\text{rel}}=0.28\%, k=2$ (> 0.2~10) s: $U_{\text{rel}}=0.24\%, k=2$ 频率: $U_{\text{rel}}=0.01\%, k=2$ 电压: $U_{\text{rel}}=0.1\%, k=2$	SXE202583085 广东省计量科学研究院	2026/07/14

校准结果

Results of calibration

证书编号 C2509253990002
Certificate No.

第 4 页 共 7 页
Page of

1. 外观及工作正常性检查
Appearance and function check
正常 Normal

2. 指示声级调整 (1000Hz)

声级计频率计权	声校准器频率	声校准器标准值	调校前声级计示值	调校后声级计示值	接受限	结论
	(Hz)	(dB)	(dB)	(dB)	(dB)	Pass/Fail
A	1000	94	93.5	94.0	93.7 ~ 94.3	Pass

3. 频率计权的声信号实验 (频率: 1000Hz/A频率计权)

声压级标准值	声压级指示值	接受限	结论
(dB)	(dB)	(dB)	Pass/Fail
44	44.2	43.2 ~ 44.8	Pass
54	54.1	53.2 ~ 54.8	Pass
64	64.0	63.2 ~ 64.8	Pass
74	74.0	73.2 ~ 74.8	Pass
84	84.0	83.2 ~ 84.8	Pass
94	94.0	93.2 ~ 94.8	Pass
104	104.0	103.2 ~ 104.8	Pass
114	114.1	113.2 ~ 114.8	Pass

4. 本机自生噪音

测试类型	频率计权	实测值 (dB)
声信号	A	41.2
	A	41.5
电信号	C	46.3
	Z	48.6

5. 级线性 (1dB ~ 10dB内变化): 起始点指示声级

频率	测量项目	90 dB 实测值	接受限	结论
(Hz)	----	(dB)	(dB)	Pass/Fail
1000	起始点以上每间隔10dB最大偏差	+0.1	± 0.3	Pass
	起始点以下每间隔10dB最大偏差	0.0	± 0.3	Pass
	距上限5dB内每隔1dB最大偏差	0.0	± 0.3	Pass
	距下限5dB内每隔1dB最大偏差	-0.1	± 0.3	Pass
8000	起始点以上每间隔10dB最大偏差	0.0	± 0.3	Pass
	起始点以下每间隔10dB最大偏差	0.0	± 0.3	Pass
	距上限5dB内每隔1dB最大偏差	-0.1	± 0.3	Pass
	距下限5dB内每隔1dB最大偏差	0.0	± 0.3	Pass

校准结果

Results of calibration

证书编号 C2509253990002
Certificate No.

第 5 页 共 7 页
Page of

6. 频率计权

频率 (Hz)	A计权标准值 (dB)	声压级指示值 (dB)	接受限 (dB)	结论 Pass/Fail
20	-50.5	-50.6	-48.5 ~ -52.5	Pass
31.5	-39.4	-39.5	-37.9 ~ -40.9	Pass
63	-26.2	-26.2	-25.2 ~ -27.2	Pass
125	-16.1	-16.2	-15.1 ~ -17.1	Pass
250	-8.6	-8.6	-7.6 ~ -9.6	Pass
500	-3.2	-3.2	-2.2 ~ -4.2	Pass
1000	0.0	0.0	+0.7 ~ -0.7	Pass
2000	+1.2	+1.2	+2.2 ~ +0.2	Pass
4000	+1.0	+1.0	+2.0 ~ 0.0	Pass
8000	-1.1	-1.3	+0.4 ~ -3.6	Pass
16000	-6.6	-9.6	-4.1 ~ -22.6	Pass
20000	-9.3	-22.5	-6.3 ~ -∞	Pass

频率 (Hz)	C计权标准值 (dB)	声压级指示值 (dB)	接受限 (dB)	结论 Pass/Fail
20	-6.2	-6.2	-4.2 ~ -8.2	Pass
31.5	-3.0	-3.0	-1.5 ~ -4.5	Pass
63	-0.8	-0.8	+0.2 ~ -1.8	Pass
125	-0.2	-0.2	+0.8 ~ -1.2	Pass
250	0.0	0.0	+1.0 ~ -1.0	Pass
500	0.0	0.0	+1.0 ~ -1.0	Pass
1000	0.0	0.0	+0.7 ~ -0.7	Pass
2000	-0.2	-0.2	+0.8 ~ -1.2	Pass
4000	-0.8	-0.8	+0.2 ~ -1.8	Pass
8000	-3.0	-3.0	-1.5 ~ -4.5	Pass
16000	-8.5	-11.5	-6.0 ~ -24.5	Pass
20000	-11.2	-24.3	-8.2 ~ -∞	Pass

校准结果

Results of calibration

证书编号 C2509253990002
Certificate No.

第 6 页 共 7 页
Page of

频率 (Hz)	Z计权标准值 (dB)	声压级指示值 (dB)	接受限 (dB)	结论 Pass/Fail
20	0.0	-0.1	+2.0 ~ -2.0	Pass
31.5	0.0	-0.1	+1.5 ~ -1.5	Pass
63	0.0	0.0	+1.5 ~ -1.5	Pass
125	0.0	0.0	+1.0 ~ -1.0	Pass
250	0.0	0.0	+1.0 ~ -1.0	Pass
500	0.0	0.0	+1.0 ~ -1.0	Pass
1000	0.0	0.0	+0.7 ~ -0.7	Pass
2000	0.0	0.0	+1.0 ~ -1.0	Pass
4000	0.0	0.0	+1.0 ~ -1.0	Pass
8000	0.0	0.0	+1.5 ~ -2.5	Pass
16000	0.0	-0.1	+2.5 ~ -16.0	Pass
20000	0.0	-0.3	+3.0 ~ -∞	Pass

7. 1kHz处的频率计权

A计权参考声级 (dB)	C频率计权相对A频率计权的偏差 (dB)	Z频率计权相对A频率计权的偏差 (dB)	结论 Pass/Fail	接受限 (dB)
94	0.0	-0.1	Pass	± 0.2

8. F和S时间计权

衰减速率 (dB/s)	实测值 (dB/s)	接受限 (dB/s)	结论 Pass/Fail
快 (F) 计权	34.6	31.0 ~ 38.5	Pass
慢 (S) 计权	4.4	3.6 ~ 5.1	Pass

9. 猝发音响应 (A计权)

猝发音持续时间 (ms)	(LAFmax-LA)标准值 (dB)	(LAFmax-LA)指示值 (dB)	接受限 (dB)	结论 Pass/Fail
200	-1.0	-1.0	-0.5 ~ -1.5	Pass
2	-18.0	-18.0	-17.0 ~ -18.5	Pass
0.25	-27.0	-27.1	-26.0 ~ -30.0	Pass
猝发音持续时间 (ms)	(LASmax-LA)标准值 (dB)	(LSFmax-LA)指示值 (dB)	接受限(dB) (dB)	结论 Pass/Fail
200	-7.4	-7.4	-6.9 ~ -7.9	Pass
2	-27.0	-27.2	-26.0 ~ -30.0	Pass

校准结果

Results of calibration

第 7 页 共 7 页
Page of证书编号 C2509253990002
Certificate No.

注: 仪器配传声器型号: AWA14425, 传声器编号: 61356

本次校准结果的扩展不确定度为:

Expanded uncertainty of measurement:

声信号: 20Hz~200Hz, $U=0.5$ dB, $k=2$; 250Hz~400Hz, $U=0.4$ dB, $k=2$; 500Hz~1250Hz, $U=0.4$ dB, $k=2$; 1600Hz~10000Hz, $U=0.6$ dB, $k=2$; 12.5kHz~20kHz, $U=1.0$ dB;正弦电信号: (0~140) dB, (20~20000) Hz, $U=0.3$ dB, $k=2$;猝发音电信号: (0~140) dB, (1000~8000) Hz, (0.25~1000)ms $U=0.3$ dB, $k=2$;时间计权 F 和 S: F:(25~40)dB/s, $U=3.2$ dB/s, $k=2$; S:(1~10)dB/s, $U=0.3$ dB/s, $k=2$ 。

备注:

Notes

1. 依据JJF1059.1-2012测量不确定度评定与表示。
According to JJF1059.1-2012 Evaluation and Expression of Uncertainty in Measurement.
2. 校准项目符合1级技术要求。
The calibrated measurand are accord with class 1 technical specifications.

以下空白
Blank below



华南国家计量测试中心
广东省计量科学研究院
SOUTH CHINA NATIONAL CENTER OF METROLOGY
GUANGDONG INSTITUTE OF METROLOGY



中国认可
国际互认
校准
CALIBRATION
CNAS L0730

校准证书

CALIBRATION CERTIFICATE

证书编号 SXE202510529
Certificate No.

第 1 页, 共 4 页
Page of

计量器具名称
Description

声校准器

型号/规格
Model/Type

AWA6221A

制造厂
Manufacturer

HANGZHOU AIHUA INSTRUMENTS CO., LTD.

出厂编号
Serial No.

AWA6221A0890E

设备管理编号
Equipment No.

接收日期

2025 年 12 月 01 日

The date of receipt

Y M D

校准日期

2025 年 12 月 06 日

The date of calibration

Y M D

发布日期

2025 年 12 月 08 日

The date of issue

Y M D

符合性声明

符合 JJG 176-2022 (1级) 全部后续项目技术要求

Statements of conformity

Comply with the requirements of all subsequent items for JJG 176-2022(Class 1)

批准

Authorized by

李敏毅 李敏毅

核 验

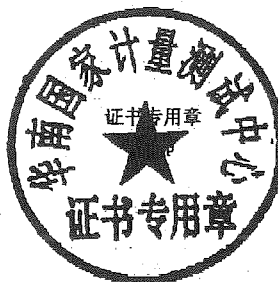
Reviewed by

何铭涛 何铭涛

校 准

Calibrated by

何卓斌 何卓斌



扫一扫查真伪

实验室地址: 中国广东省广州市广园中路松柏东街30号

邮政编码: 510405

电话: +8620 86594172 投诉电话: +8620 36611242 E-mail: scm@scm.com.cn

Add: No.30, Songbai East Street, Guangyuan Middle Road, Guangzhou, Guangdong, China

Post Code: 510405 Tel: +8620 86594172 Complaint Tel: +8620 36611242

证书真伪查询: www.scm.com.cn; cert.scm.com.cn Certificate Authenticity Identify: www.scm.com.cn; cert.scm.com.cn



说 明

证书编号 SXE202510529

Certificate No.

DIRECTIONS

第 2 页, 共 4 页

Page of

1. 本中心是国家市场监督管理总局在华南地区设立的国家法定计量检定机构, 本中心的质量管理体系符合 ISO/IEC 17025:2017 标准的要求。

This laboratory is the National Legal Metrological Verification Institution in southern China set up by the State Administration for Market Regulation. The quality system is in accordance with ISO/IEC 17025:2017.

2. 校准地点:

The location of calibration:

院本部4053

Room 4053, Headquarters

3. 本次校准使用的方法:

The method used:

JJG 176-2022 声校准器检定规程 V.R. of Sound Calibrators

4. 应用的判定规则:

The decision rule applied:

CNAS-GL015: 2022 判定规则和符合性声明指南 第6.2.1

Guidelines on Decision Rules and Statements of Conformity Clause 6.2.1

5. 本证书中的校准结果可溯源至国际单位制 (SI) 单位和/或社会公用计量标准, 本次校准使用以下计量标准器具:

The calibration results are traceable to International System of Units (SI) units and/or measurement standard for public service.

The measurement standards used:

名称 Name	型号规格 Model/Type	编号 Serial No.	证书号/溯源机构 Certificate No./ Traceability to	计量特性 Metrological Characteristic
电声标准装置	频率: 10 Hz~20 kHz	33110800	[1993] 国社量标华 南证字第085号	声压级: $U=0.4\text{dB}\sim 1.0\text{dB}$ ($k=2$); 在参考频率 上: $U=0.08\text{dB}$ ($k=2$) [压力 场]
动态信号分析仪	3560C (3110模块) /0.1 Hz~200 kHz	2392397	SXE202500778 /本中心	电压: $U_{\text{rel}}=0.2\%$, 频 率: $U_{\text{rel}}=0.002\%$ ($k=2$) Voltage: $U_{\text{rel}}=0.2\%$, Frequency : $U_{\text{rel}}=0.002\%$ ($k=2$)
工作标准传声器	4190 /20 Hz~20 kHz	2383233	SXE202500423 /本中心	20 Hz~4 kHz, $U=0.20\text{dB}$ 5 kHz~20 kHz, $U=0.50\text{dB}$ ($k=2$)
声校准器	4231 /94 dB, 114 dB	2730392	SXE202500307 /本中心	1 级 Class 1

注: 1. 本证书校准结果只与受校准仪器有关。 The results relate only to the items calibrated.

Note: 2. 未经本机构书面批准, 不得部分复制此证书。 This certificate shall not be reproduced except in full, without the written approval of our laboratory.

3. “客户名称”、“联络信息”由客户提供, “制造厂”、“型号规格”、“出厂编号”以及“设备编号”为仪器上标注, 客户对上面内容如有异议, 须在收到证书后二十个工作日内提出。

The information Name of the Customer and Contact Information are provided by customer, and the Manufacturer, Model/Type, Serial No. and Equipment No. are marked on the items. Customer shall submit any objection within 20 working days after receiving the certificate for the information above.

校准
证书



校准结果 RESULTS OF CALIBRATION

证书编号 SXE202510529
Certificate No.

原始记录号 SXE202510529
Record No.

第 3 页, 共 4 页
Page of

1 外观: 符合要求

Apparent inspection: Pass

2 声压级: 见表1

Sound Pressure Level: Shown in table 1

表1 Table 1

标称频率/Hz	规定声压级/dB	测得的声压级/dB	测得的声压级与 规定声压级之差 的绝对值/dB	接受限/dB	结论
Nominal Frequency	Specified sound pressure level	Measured sound pressure level	Absolute value of Error	Acceptance limit	Conclusion
1000	94	94.15	0.15	0.25	符合要求(Pass)
1000	114	114.21	0.21	0.25	符合要求(Pass)

3 频率: 见表2

Frequency: Shown in table 2

表2 Table 2

规定频率/Hz	标称声压级/dB	测得的频率/Hz	测得的频率与规 定频率相对误差 的绝对值/%	接受限/%	结论
Specified frequency	Nominal sound pressure level	Measured frequency	Absolute value of Error	Acceptance limit	Conclusion
1000	94	998.78	0.122	0.7	符合要求(Pass)
1000	114	998.82	0.118	0.7	符合要求(Pass)

4 总失真+噪声: 见表3

Total distortion + noise: Shown in table 3

表3 Table 3

规定频率/Hz	标称声压级/dB	总失真+噪声/%	接受限/%	结论
Specified frequency	Nominal sound pressure level	Total Distortion+ noise	Acceptance limit	Conclusion
1000	94	0.1	2.5	符合要求(Pass)
1000	114	0.2	2.5	符合要求(Pass)



校准结果 RESULTS OF CALIBRATION

证书编号 SXE202510529
Certificate No.

原始记录号 SXE202510529
Record No.

第 4 页, 共 4 页
Page of

说明:

Note:

1 测量结果扩展不确定度:

Expanded uncertainty of measurement results:

声压级: $U=0.15$ dB, 频率: $U_{rel}=0.1\%$, 总失真+噪声: $U=0.4\%$, 包含因子: $k=2$

Sound Pressure Level, Frequency, Total distortion + noise, Coverage factor

2 本证书中给出的扩展不确定度依据JJF1059.1-2012《测量不确定度评定与表示》评定, 由合成标准不确定度乘以包含概率约为95%时对应的包含因子 k 得到。

The expanded uncertainty given in this certificate is evaluated according to JJF 1059.1-2012 "Evaluation and Expression of Uncertainty in Measurement", which is obtained by multiplying the combined standard uncertainty by the coverage factor k corresponding to the coverage probability of about 95%.

3 该仪器的溯源日期为本证书的“校准日期”, 由于复校时间间隔的长短是由仪器的使用情况、使用者、仪器本身质量等诸因素所决定的, 因此, 送校单位可根据实际使用情况自主决定复校时间间隔。

更换重要部件、维修或对仪器性能有怀疑时, 应及时校准。

The traceability date of this instrument is the "Calibration Date" on this certificate, Since the calibration interval is determined by the use of the instrument, operation of the user, the quality of the instrument itself and other factors, the re-calibration date can be decided by the user according to the actual situation. In case of replacement of important parts, maintenance or doubt on the performance of the instrument, it shall be calibrated in time.

4 校准活动中对测量结果有影响的条件:

Conditions under which the calibrations were made that have an influence on the measurement results

温度 (Temperature): (22 ± 1) °C

湿度 (Humidity): $(40\sim50)$ %RH

静压 (Static pressure): $(100.0\sim101.0)$ kPa

