財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

(Certificate No：LN1001-261020)

This is to certify that

National Measurement Laboratory, R. O. C.

National Measurement Laboratory, R. O. C. (Acoustics, Vibration)

No.321, Sec. 2, Kuang Fu Rd., Hsinchu City, Taiwan, R. O. C.

is accredited in respect of laboratory

Accreditation Criteria	：	ISO/IEC 17025:2017；CNS 17025:2018
Accreditation Number	：	N1001
Originally Accredited	：	January 01, 2003
Effective Period	：	January 01, 2027 to December 31, 2031
Accredited Scope	：	Calibration Field, see described in the Appendix
Specific Accreditation Program	：	Accreditation Program for National Metrology Institutes

Scan to verify

Yi-Ling Chen
President, Taiwan Accreditation Foundation
October 20, 2026

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix

Accreditation Number ：N1001
Laboratory Head ：LAN, Yu-Ping

Vibration & Acoustics

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB1001 accelerometer	PCB 080A200/ PCB 442A102	In house method: Instrument Calibration Technique for Accelerometer - Comparison Method (Document No.: 07-3-83-0038) ISO 16063-21		V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 50 Hz to 1 kHz, Amplitude: 100 m/s^2	1.8	%
				V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 1 kHz (exclude) to 3 kHz, Amplitude: 100 m/s^2	2.8	%
				V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 3 kHz (exclude) to 7 kHz, Amplitude: 100 m/s^2	3.5	%
				pC/ (m/s^2)		pC/ (m/s^2)	Charge sensitivity: Frequency/Amplitude: (100 Hz, 160 Hz) /100 m/s^2	1.8	%
Approval Signatory: CHEN, Jiun-Kai; LO, Fang-Chun; TU, Tsung-Hsien									
KB1001 accelerometer	UNIPHASE 1101/ RENISHAW RLU10	In house method: Instrument Calibration Technique for Accelerometer - Sine-Approximation Method (Document No.: 07-3-90-0117) ISO 16063-11		V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 50 Hz to 5 kHz, Amplitude: 15 m/s^2 to 125 m/s^2	0.76	%
				V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 5 kHz (exclude) to 10 kHz, Amplitude: 100 m/s^2 to 125 m/s^2	1.8	%
				pC/ (m/s^2)		pC/ (m/s^2)	Charge sensitivity: Frequency 50 Hz to 5 kHz, Amplitude: 15 m/s^2 to 125 m/s^2	0.79	%

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB1001 accelerometer	UNIPHASE 1101/ RENISHAW RLU10	In house method: Instrument Calibration Technique for Accelerometer - Sine-Approximation Method (Document No.: 07-3-90-0117) ISO 16063-11		pC/ (m/s^2)		pC/ (m/s^2)	Charge sensitivity: Frequency 5 kHz (exclude) to 10 kHz, Amplitude: 100 m/s^2 to 125 m/s^2	1.8	%
Approval Signatory: CHEN, Jiun-Kai; LO, Fang-Chun; TU, Tsung-Hsien									
KB1001 accelerometer	UNIPHASE 1101/ RENISHAW RLU10	In house method: Instrument Calibration Technique for Accelerometer - Fringe-Counting Method (Document No.: 07-3-83-0045) ISO 16063-11		V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 50 Hz to 700 Hz, Amplitude: 15 m/s^2 to 75 m/s^2	0.44	%
				pC/ (m/s^2)		pC/ (m/s^2)	Charge sensitivity: Frequency 50 Hz to 700 Hz, Amplitude: 15 m/s^2 to 75 m/s^2	0.49	%
Approval Signatory: CHEN, Jiun-Kai; LO, Fang-Chun; TU, Tsung-Hsien									
KB1001 low frequency accelerometer	PCB 301M26/ PCB 442A102	In house method: Instrument Calibration Technique for Low Frequency Accelerometer - Comparison Method (Document No.: 07-3-86-0085) ISO 16063-21		V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 0.5 Hz to 90 Hz, Amplitude 0.2 m/s^2 to 5 m/s^2	1.8	%
				V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 100 Hz, Amplitude 5 m/s^2	1.9	%
				V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 160 Hz, Amplitude 2 m/s^2	2.6	%
Approval Signatory: CHEN, Jiun-Kai; LO, Fang-Chun; TU, Tsung-Hsien									

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB1001 low frequency accelerometer	SIOS SL 02/1	In house method: Instrument Calibration Technique for Low Frequency Accelerometer - Sine Approximation Method (Document No.: 07-3-87-0004) ISO 16063-11		V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 0.1 Hz, Amplitude 0.01 m/s^2	1.7	%
				V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 0.2 Hz, Amplitude 0.05 m/s^2	1.4	%
				V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 0.2 Hz (exclude) to 100 Hz, Amplitude 0.1 m/s^2 to 5 m/s^2	1.3	%
				V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Frequency 100 Hz (exclude) to 160 Hz, Amplitude 2 m/s^2 to 5 m/s^2	1.7	%
Approval Signatory: CHEN, Jiun-Kai; LO, Fang-Chun; TU, Tsung-Hsien									
KB1001 shock accelerometer	PCB 301A12/ PCB 482A21	In house method: Instrument Calibration Technique for Shock Accelerometer - Comparison Method (Document No.: 07-3-76-0007) ISO 16063-22		V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Acceleration: 200 m/s^2 to 10000 m/s^2, Shock duration 0.6 ms to 3.0 ms	1.8	%
Approval Signatory: CHEN, Jiun-Kai; LO, Fang-Chun; TU, Tsung-Hsien									

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB1001 shock accelerometer	REO 32734/ Polytec OFV-5000-KU	In house method: Instrument Calibration Technique for Shock Accelerometer - Phase Operation Method (Document No.: 07-3-98-6157) ISO 16063-13		V/ (m/s^2)		V/ (m/s^2)	Voltage sensitivity: Acceleration: 200 m/s^2 to 10000 m/s^2, Shock duration 0.3 ms to 3.0 ms	1.0	%
				pC/ (m/s^2)		pC/ (m/s^2)	Charge sensitivity: Acceleration: 200 m/s^2 to 10000 m/s^2, Shock duration 0.3 ms to 3.0 ms	1.0	%
Approval Signatory: CHEN, Jiun-Kai; LO, Fang-Chun; TU, Tsung-Hsien									
KB1002 low frequency vibration meter	PCB 301M26/ PCB 442A102	In house method: Instrument Calibration Technique for Vibration Meter - Comparison Method (Document No.: 07-3-77-0030)		m/s^2		m/s^2	Acceleration: Frequency 3.15 Hz to 50 Hz, Frequency/Amplitude: 3.15 Hz/3.5 m/s^2, (5 Hz, 6.3 Hz, 10 Hz, 15 Hz, 16 Hz, 20 Hz, 30 Hz, 31.5 Hz, 40 Hz, 50 Hz) /5 m/s^2	1.5	%
				mm/s		mm/s	Velocity: Frequency 3.15 Hz to 50 Hz, Frequency/Amplitude: (3.15 Hz/176.83 mm/s) , (5 Hz/159.26 mm/s) , (6.3 Hz/126.32 mm/s) , (10 Hz/79.57 mm/s) , (15 Hz/53.08 mm/s) , (16 Hz/49.72 mm/s) , (20 Hz/39.82 mm/s) , (30 Hz/26.54 mm/s) , (31.5 Hz/25.27 mm/s) , (40 Hz/19.96 mm/s) , (50 Hz/15.94 mm/s)	1.7	%

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB1002 low frequency vibration meter	PCB 301M26/ PCB 442A102	In house method: Instrument Calibration Technique for Vibration Meter - Comparison Method (Document No.: 07-3-77-0030)		mm		mm	Displacement: Frequency 3.15 Hz to 20 Hz, Frequency/Amplitude: (3.15 Hz/17.87 mm) , (5 Hz/10.14 mm) , (6.3 Hz/6.38 mm) , (10 Hz/2.53 mm) , (15 Hz/1.13 mm) , (16 Hz/0.99 mm) , (20 Hz/0.63 mm)	1.9	%
				mm		mm	Displacement: Frequency 20 Hz (exclude) to 50 Hz, Frequency/Amplitude: (30 Hz/0.28 mm) , (31.5 Hz/0.26 mm) , (40 Hz/0.16 mm) , (50 Hz/0.1 mm)	2.4	%
Approval Signatory: CHEN, Jiun-Kai; LO, Fang-Chun; TU, Tsung-Hsien									
KB1002 vibration meter	PCB 080A200/ PCB 442A102	In house method: Instrument Calibration Technique for Vibration Meter - Comparison Method (Document No.: 07-3-77-0030)		m/s^2		m/s^2	Acceleration: Frequency 50 Hz to 2 kHz, Frequency/Amplitude: (50 Hz, 100 Hz, 160 Hz, 200 Hz, 300 Hz, 400 Hz, 500 Hz, 600 Hz, 700 Hz, 800 Hz, 900 Hz, 1000 Hz, 1500 Hz, 2000 Hz) /100 m/s^2	1.6	%
				m/s^2		m/s^2	Acceleration: Frequency 2 kHz (exclude) to 5 kHz, Frequency/Amplitude: (3000 Hz, 4000 Hz, 5000 Hz) /100 m/s^2	2.7	%

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB1002 vibration meter	PCB 080A200/ PCB 442A102	In house method: Instrument Calibration Technique for Vibration Meter - Comparison Method (Document No.: 07-3-77-0030)		mm/s		mm/s	Velocity: Frequency 50 Hz to 2 kHz, Frequecy/Amplitude: (50 Hz/318.12 mm/s) , (100 Hz/159.09 mm/s) , (160 Hz/99.45 mm/s) , (200 Hz/79.50 mm/s) , (300 Hz/52.80 mm/s) , (400 Hz/39.70 mm/s) , (500 Hz/31.70 mm/s) , (600 Hz/26.50 mm/s) , (700 Hz/22.70 mm/s) , (800 Hz/19.90 mm/s) , (900 Hz/17.68 mm/s) , (1000 Hz/15.90 mm/s) , (1500 Hz/10.61 mm/s) , (2000 Hz/7.96 mm/s)	1.7	%
				mm		mm	Displacement: Frequency 50 Hz to 100 Hz, Frequency/Amplitude: (50 Hz/2.03 mm) , (100 Hz/0.51 mm)	1.9	%
				mm		mm	Displacement: Frequency 100 Hz (exclude) to 200 Hz, Frequency/Amplitude: (160 Hz/0.20 mm) , (200 Hz/0.13 mm)	2.3	%
Approval Signatory: CHEN, Jiun-Kai; LO, Fang-Chun; TU, Tsung-Hsien									

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB1099 charge amplifier	HP 16383A	In house method: Instrument Calibration Technique for Charge Amplifier (Document No.: 07-3-96-0230)		mV/pC		mV/pC	Frequency 10 Hz	1.2	%
				mV/pC		mV/pC	Frequency 10 Hz (exclude) to 10 kHz	0.10	%
Approval Signatory: CHEN, Jiun-Kai; LO, Fang-Chun; TU, Tsung-Hsien									
KB2001 microphone	B&K 4160/ B&K 4180	In house method: Instrument Calibration Technique for Microphone Free-Field Sensitivity - Reciprocity Method (Document No.: 07-3-A2-0205) IEC 61094-3		dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS1P: Frequency 1 kHz to 10 kHz (fulfilling IEC 61094-1, LS1P)	0.14	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2P: Frequency 1 kHz to 16 kHz (fulfilling IEC 61094-1, LS2aP, LS2F)	0.14	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2P: Frequency 16 kHz (exclude) to 32 kHz (fulfilling IEC 61094-1, LS2aP, LS2F)	0.16	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2P: Frequency 32 kHz (exclude) to 40 kHz (fulfilling IEC 61094-1, LS2aP, LS2F)	0.18	dB
Approval Signatory: KUO, Shu-Fen; LO, Fang-Chun; TU, Tsung-Hsien									

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB2001 microphone	B&K 4180	In house method: Instrument Calibration Technique for Microphone Free-Field Sensitivity - Comparison Method (Document No.: 07-3-B0-0057) IEC 61094-8		dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2/WS2: Frequency 250 Hz to 20 kHz (fulfilling IEC 61094-1, LS2 and IEC 61094-4, WS2)	0.40	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2/WS2: Frequency 20 kHz (exclude) to 25.2 kHz (fulfilling IEC 61094-1, LS2 and IEC 61094-4, WS2)	0.50	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2/WS2: Frequency 25.2 kHz (exclude) to 32 kHz (fulfilling IEC 61094-1, LS2 and IEC 61094-4, WS2)	0.60	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2/WS2: Frequency 32 kHz (exclude) to 40 kHz (fulfilling IEC 61094-1, LS2 and IEC 61094-4, WS2)	0.70	dB
Approval Signatory: KUO, Shu-Fen; LO, Fang-Chun; TU, Tsung-Hsien									
KB2001 microphone	B&K 4180	In house method: Instrument Calibration Technique for Microphone Sound Pressure Sensitivity - Reciprocity Method (Document No.: 07-3-83-0046) IEC 61094-2		dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2P: Frequency 10 Hz to 16 Hz (fulfilling IEC 61094-1, LS2aP, LS2F)	0.06	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2P: Frequency 16 Hz (exclude) to 3.2 kHz (fulfilling IEC 61094-1, LS2aP, LS2F)	0.05	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2P: Frequency 3.2 kHz (exclude) to 8 kHz (fulfilling IEC 61094-1, LS2aP, LS2F)	0.06	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2P: Frequency 8 kHz (exclude) to 10 kHz (fulfilling IEC 61094-1, LS2aP, LS2F)	0.08	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2P: Frequency 10 kHz (exclude) to 16 kHz (fulfilling IEC 61094-1, LS2aP, LS2F)	0.12	dB

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB2001 microphone	B&K 4180	In house method: Instrument Calibration Technique for Microphone Sound Pressure Sensitivity - Reciprocity Method (Document No.: 07-3-83-0046) IEC 61094-2		dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2P: Frequency 16 kHz (exclude) to 20 kHz (fulfilling IEC 61094-1, LS2aP, LS2F)	0.14	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS2P: Frequency 20 kHz (exclude) to 25.2 kHz (fulfilling IEC 61094-1, LS2aP, LS2F)	0.22	dB
Approval Signatory: KUO, Shu-Fen; LO, Fang-Chun; TU, Tsung-Hsien									
KB2001 microphone	B&K 4160	In house method: Instrument Calibration Technique for Microphone Sound Pressure Sensitivity - Reciprocity Method (Document No.: 07-3-83-0046) IEC 61094-2		dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS1P: Frequency 2 Hz to 2.5 Hz (fulfilling IEC 61094-1, LS1P)	0.08	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS1P: Frequency 2.5 Hz (exclude) to 8 Hz (fulfilling IEC 61094-1, LS1P)	0.06	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS1P: Frequency 8 Hz (exclude) to 2 kHz (fulfilling IEC 61094-1, LS1P)	0.05	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS1P: Frequency 2 kHz (exclude) to 4 kHz (fulfilling IEC 61094-1, LS1P)	0.06	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS1P: Frequency 4 kHz (exclude) to 6.3 kHz (fulfilling IEC 61094-1, LS1P)	0.08	dB

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB2001 microphone	B&K 4160	In house method: Instrument Calibration Technique for Microphone Sound Pressure Sensitivity - Reciprocity Method (Document No.: 07-3-83-0046) IEC 61094-2		dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS1P: Frequency 6.3 kHz (exclude) to 10 kHz (fulfilling IEC 61094-1, LS1P)	0.12	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	LS1P: Frequency 10 kHz (exclude) to 12.6 kHz (fulfilling IEC 61094-1, LS1P)	0.16	dB
Approval Signatory: KUO, Shu-Fen; LO, Fang-Chun; TU, Tsung-Hsien									
KB2001 microphone	B&K 4160/ B&K 4180	In house method: Instrument Calibration Technique for Microphone Sound Pressure Sensitivity - Comparison Method (Document No.: 07-3-A5-0152) IEC 61094-5		dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	Frequency 20 Hz to 4 kHz (fulfilling IEC 61094-1, LS1 and IEC 61094-4, WS1)	0.10	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	Frequency 4 kHz (exclude) to 6.3 kHz (fulfilling IEC 61094-1, LS1 and IEC 61094-4, WS1)	0.12	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	Frequency 6.3 kHz (exclude) to 10 kHz (fulfilling IEC 61094-1, LS1 and IEC 61094-4, WS1)	0.16	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	Frequency 10 kHz (exclude) to 12.6 kHz (fulfilling IEC 61094-1, LS1 and IEC 61094-4, WS1)	0.20	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	Frequency 20 Hz to 8 kHz (fulfilling IEC 61094-1, LS2 and IEC 61094-4, WS2)	0.10	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	Frequency 8 kHz (exclude) to 10 kHz (fulfilling IEC 61094-1, LS2 and IEC 61094-4, WS2)	0.12	dB

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB2001 microphone	B&K 4160/ B&K 4180	In house method: Instrument Calibration Technique for Microphone Sound Pressure Sensitivity - Comparison Method (Document No.: 07-3-A5-0152) IEC 61094-5		dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	Frequency 10 kHz (exclude) to 16 kHz (fulfilling IEC 61094-1, LS2 and IEC 61094-4, WS2)	0.16	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	Frequency 16 kHz (exclude) to 20 kHz (fulfilling IEC 61094-1, LS2 and IEC 61094-4, WS2)	0.20	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	Frequency 20 Hz to 8 kHz (fulfilling IEC 61094-4, WS3)	0.10	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	Frequency 8 kHz (exclude) to 10 kHz (fulfilling IEC 61094-4, WS3)	0.12	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	Frequency 10 kHz (exclude) to 16 kHz (fulfilling IEC 61094-4, WS3)	0.18	dB
				dB (reference: 1 V/Pa)		dB (reference: 1 V/Pa)	Frequency 16 kHz (exclude) to 20 kHz (fulfilling IEC 61094-4, WS3)	0.26	dB
Approval Signatory: KUO, Shu-Fen; LO, Fang-Chun; TU, Tsung-Hsien									
KB2002 pistonphone	B&K 4144 (WS1P) / B&K 4134 (WS2P)	In house method: Instrument Calibration Technique for Sound Calibrator - Insert-Voltage Technique (Document No.: 07-3-83-0050)	90	dB (reference: 20 μPa)	130	dB (reference: 20 μPa)	Frequency 250 Hz	0.12	dB
Approval Signatory: KUO, Shu-Fen; LO, Fang-Chun; TU, Tsung-Hsien									

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB2002 pistonphone	B&K 4160 (LS1P) / B&K 4180 (LS2P)	In house method: Instrument Calibration Technique for Sound Calibrator - Insert-Voltage Technique (Document No.: 07-3-83-0050)	90	dB (reference: 20 μPa)	130	dB (reference: 20 μPa)	Frequency 250 Hz	0.09	dB
Approval Signatory: KUO, Shu-Fen; LO, Fang-Chun; TU, Tsung-Hsien									
KB2002 pistonphone	B&K 4228	In house method: Instrument Calibration Technique for Sound Calibrator - Comparison Method (Document No.: 07-3-80-0027)	90	dB (reference: 20 μPa)	130	dB (reference: 20 μPa)	Frequency 250 Hz	0.16	dB
Approval Signatory: KUO, Shu-Fen; LO, Fang-Chun; TU, Tsung-Hsien									
KB2003 sound calibrator	B&K 4144 (WS1P) / B&K 4134 (WS2P)	In house method: Instrument Calibration Technique for Sound Calibrator - Insert-Voltage Technique (Document No.: 07-3-83-0050)	90	dB (reference: 20 μPa)	120	dB (reference: 20 μPa)	Sound calibrator: Frequency 1 kHz	0.12	dB
			90	dB (reference: 20 μPa)	120	dB (reference: 20 μPa)	Multi-frequency sound calibrator: Frequency 31.5 Hz	0.15	dB
			90	dB (reference: 20 μPa)	120	dB (reference: 20 μPa)	Multi-frequency sound calibrator: Frequency 63 Hz to 8 kHz	0.12	dB
			90	dB (reference: 20 μPa)	120	dB (reference: 20 μPa)	Multi-frequency sound calibrator: Frequency 12.5 kHz to 16 kHz	0.19	dB
Approval Signatory: KUO, Shu-Fen; LO, Fang-Chun; TU, Tsung-Hsien									

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB2003 sound calibrator	B&K 4160 (LS1P) / B&K 4180 (LS2P)	In house method: Instrument Calibration Technique for Sound Calibrator - Insert-Voltage Technique (Document No.: 07-3-83-0050)	90	dB (reference: 20 μPa)	120	dB (reference: 20 μPa)	Sound calibrator: Frequency 1 kHz	0.09	dB
			90	dB (reference: 20 μPa)	120	dB (reference: 20 μPa)	Multi-frequency sound calibrator: Frequency 31.5 Hz	0.10	dB
			90	dB (reference: 20 μPa)	120	dB (reference: 20 μPa)	Multi-frequency sound calibrator: Frequency 63 Hz to 8 kHz	0.10	dB
			90	dB (reference: 20 μPa)	120	dB (reference: 20 μPa)	Multi-frequency sound calibrator: Frequency 12.5 kHz to 16 kHz	0.14	dB
Approval Signatory: KUO, Shu-Fen; LO, Fang-Chun; TU, Tsung-Hsien									
KB2003 sound calibrator	B&K 4231	In house method: Instrument Calibration Technique for Sound Calibrator - Comparison Method (Document No.: 07-3-80-0027)	90	dB (reference: 20 μPa)	120	dB (reference: 20 μPa)	Frequency 1 kHz	0.16	dB
Approval Signatory: KUO, Shu-Fen; LO, Fang-Chun; TU, Tsung-Hsien									
KB2004 sound level meter	B&K 4228/ B&K 4231/ B&K 4226	In house method: Instrument Calibration Technique for Sound Pressure Level of Sound Level Meter (Document No.: 07-3-97-0083)	124	dB (reference: 20 μPa)	124	dB (reference: 20 μPa)	Frequency 250 Hz	0.2	dB
			94	dB (reference: 20 μPa)	114	dB (reference: 20 μPa)	Frequency 31.5 Hz	0.3	dB
			94	dB (reference: 20 μPa)	114	dB (reference: 20 μPa)	Frequency 63 Hz to 1 kHz	0.3	dB

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KB2004 sound level meter	B&K 4228/ B&K 4231/ B&K 4226	In house method: Instrument Calibration Technique for Sound Pressure Level of Sound Level Meter (Document No.: 07-3-97-0083)	94	dB (reference: 20 μPa)	114	dB (reference: 20 μPa)	Frequency 2 kHz to 4 kHz	0.3	dB
			94	dB (reference: 20 μPa)	114	dB (reference: 20 μPa)	Frequency 8 kHz	0.4	dB
			94	dB (reference: 20 μPa)	114	dB (reference: 20 μPa)	Frequency 12.5 kHz	0.5	dB
			94	dB (reference: 20 μPa)	114	dB (reference: 20 μPa)	Frequency 16 kHz	0.6	dB
Approval Signatory: KUO, Shu-Fen; LO, Fang-Chun; TU, Tsung-Hsien									

Note：Smallest uncertainty represents an expanded uncertainty using a coverage factor approximately 95 % level of confidence.
(Null Below)