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

Certificate of Accreditation

(Certificate No：LN0882-251205)

This is to certify that

National Measurement Laboratory, R. O. C.
National Measurement Laboratory, R.O.C.
(Flow, Force and Mass, Pressure and Vacuum)
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	：	N0882
Originally Accredited	：	January 01, 2002
Effective Period	：	January 01, 2026 to December 31, 2030
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
December 05, 2025

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

Accreditation Number ：N0882
Laboratory Head ：LAN, Yu-Ping

Mass/Force

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
KC1001 Weight	Weight Mettler/E_1 Häfner/E_1 Häfner/F_1	In house method: Instrument Calibration Technique for the High Capacity Mass Weighing System-Direct Comparison Method (Document No.: 07-3-A3-0249)	2	kg	2	kg		0.88	mg
			5	kg	5	kg		1.7	mg
			10	kg	10	kg		3.3	mg
			20	kg	20	kg		6.7	mg
			50	kg	50	kg		15	mg
			1000	kg	1000	kg		3.0	g
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KC1001 Weight	Weight Mettler/E_1 Häfner/E_1	In house method: Instrument Calibration Technique for the Low-Capacity Mass Weighing System-Direct Comparison Method (Document No.: 07-3-A0-0756)	1	kg	1	kg		0.066	mg
			500	g	500	g		0.039	mg
			200	g	200	g		0.018	mg
			100	g	100	g		0.0099	mg
			50	g	50	g		0.0093	mg
			20	g	20	g		0.0093	mg
			10	g	10	g		0.0035	mg
			5	g	5	g		0.0035	mg
			2	g	2	g		0.0035	mg
			1	g	1	g		0.0012	mg
			500	mg	500	mg		0.0012	mg
			200	mg	200	mg		0.0012	mg
			100	mg	100	mg		0.0012	mg
			50	mg	50	mg		0.0005	mg

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
KC1001 Weight	Weight Mettler/E_1 Häfner/E_1	In house method: Instrument Calibration Technique for the Low-Capacity Mass Weighing System-Direct Comparison Method (Document No.: 07-3-A0-0756)	20	mg	20	mg		0.0003	Mg
			10	mg	10	mg		0.0003	mg
			5	mg	5	mg		0.0003	mg
			2	mg	2	mg		0.0003	mg
			1	mg	1	mg		0.0003	mg
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KC1001 Weight	Prototype No. 78	In house method: Instrument Calibration Technique for Weights with Prototype Balance (Document No.: 07-3-88-0031)	1	kg	1	kg		0.051	mg
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KC1001 Weight	Weight Mettler/E_1 Häfner/E_1	In house method: Instrument Calibration Technique for the Mass Weighing System-Subdivision Method (Document No.: 07-3-A0-1010)	1	kg	1	kg		0.055	mg
			500	g	500	g		0.028	mg
			200	g	200	g		0.011	mg
			100	g	100	g		0.0058	mg
			50	g	50	g		0.0029	mg
			20	g	20	g		0.0015	mg
			10	g	10	g		0.0012	mg
			5	g	5	g		0.00091	mg
			2	g	2	g		0.00034	mg
			1	g	1	g		0.00033	mg
			500	mg	500	mg		0.00021	mg
			200	mg	200	mg		0.00018	mg
			100	mg	100	mg		0.00018	mg
			50	mg	50	mg		0.00011	mg
			20	mg	20	mg		0.00011	mg

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
KC1001 Weight	Weight Mettler/E_1 Häfner/E_1	In house method: Instrument Calibration Technique for the Mass Weighing System-Subdivision Method (Document No.: 07-3-A0-1010)	10	mg	10	mg		0.00011	Mg
			5	mg	5	mg		0.00012	mg
			2	mg	2	mg		0.00011	mg
			1	mg	1	mg		0.00011	mg
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KC2002 Force transducer Load cell	Dead weight force standard machine NML 500 N Morehouse 5 kN NML 50 kN Force transducer HBM C4 200 kN HBM C4 500 kN HBM KD 2 MN	ASTM E74, ISO 376	10	N	500	N	Compression	2.0E-05	
			0.5	kN	5	kN	Compression	2.0E-05	
			5	kN	50	kN	Compression	3.0E-05	
			50	kN	200	kN	Compression	3.0E-04	
			200	kN	500	kN	Compression	3.0E-04	
			500	kN	2000	kN	Compression	5.0E-04	
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KC2002 Force transducer Load cell	Dead weight force standard machine NML 500 N Morehouse 5 kN NML 50 kN Force transducer HBM C4 200 kN	ASTM E74, ISO 376	10	N	500	N	Tension	2.0E-05	
			0.5	kN	5	kN	Tension	2.0E-05	
			5	kN	50	kN	Tension	3.0E-05	
			50	kN	200	kN	Tension	3.0E-04	
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									

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
KC2003 Ring dynamometer	Dead weight force standard machine NML 500 N Morehouse 5 kN NML 50 kN Force transducer HBM C4 200 kN HBM C4 500 kN HBM KD 2 MN	ASTM E74, ISO 376	10	N	500	N	Compression	2.0E-05	
			0.5	kN	5	kN	Compression	2.0E-05	
			5	kN	50	kN	Compression	3.0E-05	
			50	kN	200	kN	Compression	3.0E-04	
			200	kN	500	kN	Compression	3.0E-04	
			500	kN	2000	kN	Compression	5.0E-04	
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KC2003 Ring dynamometer	Dead weight force standard machine NML 500 N Morehouse 5 kN NML 50 kN Force transducer HBM C4 200 kN	ASTM E74, ISO 376	10	N	500	N	Tension	2.0E-05	
			0.5	kN	5	kN	Tension	2.0E-05	
			5	kN	50	kN	Tension	3.0E-05	
			50	kN	200	kN	Tension	3.0E-04	
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KC2004 Force gauge	Dead weight force standard machine NML 500 N Morehouse 5 kN NML 50 kN Force transducer HBM C4 200 kN HBM C4 500 kN HBM KD 2 MN	ASTM E74, ISO 376	10	N	500	N	Compression	2.0E-05	
			0.5	kN	5	kN	Compression	2.0E-05	
			5	kN	50	kN	Compression	3.0E-05	
			50	kN	200	kN	Compression	3.0E-04	
			200	kN	500	kN	Compression	3.0E-04	
			500	kN	2000	kN	Compression	5.0E-04	
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									

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
KC2004 Force gauge	Dead weight force standard machine NML 500 N Morehouse 5 kN NML 50 kN Force transducer HBM C4 200 kN	ASTM E74, ISO 376	10	N	500	N	Tension	2.0E-05	
			0.5	kN	5	kN	Tension	2.0E-05	
			5	kN	50	kN	Tension	3.0E-05	
			50	kN	200	kN	Tension	3.0E-04	
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KC2007 Micro/nano mechanical properties specimen	Micro/Nano mechanical property measurement system MTS, Nano Bionix	In house method: Instrument Calibration Technique for Micro/Nano Mechanical Properties Measurement System (Document no.: 07-3-99-4218)	0.1	mm	50	mm	Displacement	4.2 (Young's modulus)	%
			10	mN	200	mN	Force	4.2 (Young's modulus)	%
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KC4003 Torque gauge (Torque transducer)	Torque standard machine HT-1234 5kNm	In house method: Instrument Calibration Technique for Torque Calibration System-Torque Transducer (Document No.: 07-3-A5-0244)	50	N·m	5000	N·m	CW, CCW	0.03	%
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									

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
KC5001 Rockwell hardness block	Rockwell hardness standard machine MATSUZAWA/Ria-F	ISO 6508-3		HRA		HRA		0.30	HRA
				HRB		HRB		0.40	HRB
				HRC		HRC		0.30	HRC
				HR30N		HR30N		0.40	HR30N
				HR30T		HR30T		0.40	HR30T
				HR15N		HR15N		0.40	HR15N
				HR15T		HR15T		0.40	HR15T
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KC5001 Vickers hardness block	Vickers hardness standard machine AKASHI/SHT-41	ISO 6507-3	100	HV	900	HV	HV2 to HV30	6.0	%
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KC5001 Micro-Vickers hardness block	Micro-Vickers hardness standard machine AKASHI/HM-124	ISO 6507-3	100	HV	200	HV	HV0.05	6.7	%
			100	HV	400	HV	HV0.1	5.9	%
			100	HV	900	HV	HV0.2	5.4	%
			100	HV	900	HV	HV0.3	5.3	%
			100	HV	900	HV	HV0.5	5.1	%
			100	HV	900	HV	HV1	5.0	%
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									

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
KC5003 Nanoindentation specimen	Nanoindentation measurement system Hysitron, TriboIndenter	In house method: Instrument Calibration Technique for Nanoindentaion System (Document No.: 07-3-93-0242)	50	nm	300	nm	Displacement	2.4 (Indentation hardness)	%
			0.5	mN	10	mN	Force	2.4 (Indentation hardness)	%
			50	nm	300	nm	Displacement	3.1 (Reduced modulus)	%
			0.5	mN	10	mN	Force	3.1 (Reduced modulus)	%
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									

Pressure/Vacuum

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
KD1001 Gas operated piston pressure gauge	Gas lubricated piston gauge Ruska 2465 Gas lubricated piston gauge DHI PG7607 Gas lubricated piston gauge DHI PG7601	In house method: Instrument Calibration Technique for Gas Lubricated Piston Gauge (Cross-Float Method) (Document No.: 07-3-90-0068)	5	kPa	172	kPa		3.4E-05 (gauge pressure)	
			172	kPa	700	kPa		2.6E-05 (gauge pressure)	
			700	kPa	7000	kPa		4.2E-05 (gauge pressure)	
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LIU, Li-Wei; LO, Yu-Jan									

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
KD1002 Oil operated piston pressure gauge	Oil lubricated piston gauge FLUKE PG7302	In house method: Instrument Calibration Technique for Oil Operated Piston Gauge (PG7302/Cross-Float Method) (Document No.: 07-3-A9-0137)	0.5	MPa	5	MPa		$7 + 5.7E\text{-}05 \times p$ (gauge pressure, p in Pa)	Pa
			5	MPa	28	MPa		3.3E-05 (gauge pressure)	
			28	MPa	280	MPa		7.4E-05 (gauge pressure)	
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LIU, Li-Wei; LO, Yu-Jan									
KD1003 Mercury manometer	Pressure controller /Calibrator DHI PPC4	In house method: Instrument Calibration Technique for Pressure Controller/Calibrator (Document No.: 07-3-98-4269)	17	kPa	700	kPa		0.034 (absolute pressure)	kPa
			0	kPa	700	kPa		0.034 (gauge pressure)	kPa
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LIU, Li-Wei; LO, Yu-Jan									
KD1004 Pressure gauge Digital pressure gauge Pressure transducer (with display)	Force balance piston gauge DHI FPG 8601	In house method: Instrument Calibration Technique for the Force Balanced Piston Gauge (Document No.: 07-3-A4-0158)	1	Pa	10	kPa		0.37 (gauge pressure)	Pa
			10	kPa	15	kPa		0.55 (gauge pressure)	Pa
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LIU, Li-Wei; LO, Yu-Jan									

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
KD1004 Pressure gauge Digital pressure gauge Pressure transducer (with display)	Oil lubricated piston gauge FLUKE PG7302	In house method: Instrument Calibration Technique for Oil Operated Piston Gauge (PG7302/Comparison Method) (Document No.: 07-3-A9-0136)	0.5	MPa	5	MPa		$7 + 5.7E\text{-}05 \times p$ (gauge pressure, p in Pa)	Pa
			5	MPa	28	MPa		3.3E-05 (gauge pressure)	
			28	MPa	280	MPa		7.4E-05 (gauge pressure)	
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LIU, Li-Wei; LO, Yu-Jan									
KD1004 Pressure gauge Digital pressure gauge Pressure transducer (with display)	Gas lubricated piston gauge Ruska 2465	In house method: Instrument Calibration Technique for Gas Lubricated Piston Gauge (Comparison Method) (Document No.: 07-3-90-0066)	17	kPa	172	kPa		$(7.08E\text{-}10 \times p^2 + 4.00)^{1/2}$ (absolute pressure, p in Pa)	Pa
			17	kPa	172	kPa		3.4E-05 (gauge pressure)	
			172	kPa	700	kPa		3.5E-05 (absolute pressure)	
			172	kPa	700	kPa		2.6E-05 (gauge pressure)	
			700	kPa	7000	kPa		4.2E-05 (absolute pressure)	
			700	kPa	7000	kPa		4.2E-05 (gauge pressure)	
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LIU, Li-Wei; LO, Yu-Jan									

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
KD1004 Pressure gauge Digital pressure gauge Pressure transducer (with display)	Pressure controller /Calibrator DHI PPC4	In house method: Instrument Calibration Technique for Pressure Controller /Calibrator (Document No.: 07-3-98-4269)	17	kPa	700	kPa		0.034 (absolute pressure)	kPa
			0	kPa	700	kPa		0.034 (gauge pressure)	kPa
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LIU, Li-Wei; LO, Yu-Jan									
KD1007 Differential pressure gauge	Force balance piston gauge DHI FPG 8601	In house method: Instrument Calibration Technique for the Force Balanced Piston Gauge (Document No.: 07-3-A4-0158)	1	Pa	10	kPa		0.37 (gauge pressure)	Pa
			10	kPa	15	kPa		0.55 (gauge pressure)	Pa
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LIU, Li-Wei; LO, Yu-Jan									
KD2001 Spinning rotor viscosity vacuum gauge	Spinning rotor viscosity vacuum gauge MKS SRG-SH700	In house method: Instrument Calibration Technique for Spinning Rotor Viscosity Gauge (Document No.: 07-3-80-0079)	0.0006	Pa	1	Pa		0.029*P* (*P* in Pa)	Pa
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									

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
KD2002 Ionization vacuum gauge	Hot cathode ionization vacuum gauge Leybold IE 414, Spinning rotor viscosity vacuum gauge MKS SRG-SH700	In house method: Instrument Calibration Technique for Ionization Gauge (Document No.: 07-3-80-0077)	5E-06	Pa	0.0001	Pa		0.074*P* (*P* in Pa)	Pa
			0.0001	Pa	0.008	Pa		0.069*P* (*P* in Pa)	Pa
			0.008	Pa	1	Pa		0.029*P* (*P* in Pa)	Pa
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KD2003 Capacitance diaphragm vacuum gauge	Capacitance diaphragm vacuum gauge MKS 390HA-00010SP05, MKS 690A13TRA	In house method: Instrument Calibration Technique for Vacuum Gauge in the Medium and Low Vacuum range (Document No.: 07-3-91-0044)	0.2	Pa	100	kPa		0.018*P* (*P* in Pa)	Pa
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KD2005 Thermocouple vacuum gauge	Capacitance diaphragm vacuum gauge MKS 390HA-00010SP05, MKS 690A13TRA	In house method: Instrument Calibration Technique for Vacuum Gauge in the Medium and Low Vacuum range (Document No.: 07-3-91-0044)	0.2	Pa	100	kPa		0.018*P* (*P* in Pa)	Pa
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									
KD2006 Vacuum gauge	Capacitance diaphragm vacuum gauge MKS 390HA-00010SP05, MKS 690A13TRA	In house method: Instrument Calibration Technique for Vacuum Gauge in the Medium and Low Vacuum range (Document No.: 07-3-91-0044)	0.2	Pa	100	kPa		0.018*P* (*P* in Pa)	Pa
Approval Signatory: WU, Yu-Hsin; CHEN, Sheng-Jui; LO, Yu-Jan									

Flow

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
KH1001 Sonic nozzle, Turbine, Ultrasonic, Rotary flowmeters	Gyroscopic scale WOHWA/9631	In house method: Instrument Calibration Techniques for High Pressure Air-Flow Calibration System - Gravimetric Method (Document No.: 07-3-83-0042)	18	kg/h	5400	kg/h	(500 to 6000) kPa; (5 to 60) bar	0.12	%
			15	m^3/h	4500	m^3/h	(500 to 6000) kPa; (5 to 60) bar	0.12	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH1001 Sonic nozzle, Laminar, Differential-pressure flowmeters	Constant volume tank CMS/500 L, CMS/30 L, CMS/2 L	In house method: Instrument Calibration Technique for Gas Meter by Low Pressure Gas Flow Calibration System (PVTt) - Primary Method (Document No.: 07-3-A2-0284)	0.01	L/min	300	L/min		0.10	%
			0.2	mg/s	6000	mg/s		0.10	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH1001 Sonic nozzle, Laminar, Coriolis, Thermal-mass, Differential-pressure, Turbine, Variable-area, Ultrasonic, Vortex flowmeters	Sonic nozzle HIRAI/-	In house method: Instrument Calibration Techniques for High Pressure Air-Flow Calibration System - Comparison Method (Document No.: 07-3-86-0115)	18	kg/h	14000	kg/h	(100 to 6000) kPa; (1 to 60) bar; m^3/h (standard condition)	0.17	%
			15	m^3/h	12000	m^3/h	(100 to 6000) kPa; (1 to 60) bar; m^3/h (standard condition)	0.17	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									

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
KH1001 Sonic nozzle, Thermal-mass, Differential-pressure, Laminar, Variable-area, Piston-prover flowmeters	Bell prover BROOKS/1093	In house method: Instrument Calibration Technique for Low Pressure Gas Flow Calibration System - Bell 1093 Calibrating Meter (Document No.: 07-3-76-0010)	0.2	g/s	20	g/s		0.11	%
			10	L/min	1000	L/min		0.11	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH1001 Sonic nozzle, Thermal-mass, Differential-pressure, Laminar, Variable-area, Piston-prover flowmeters	Sonic nozzle FLOW SYSTEMS /d=0.204, d=0.100, d=0.049, d=0.024, CMS/-	In house method: Instrument Calibration Technique for Gas Meter by Low Pressure Gas Calibration System - Master Meter Method (Document No.: 07-3-A0-2020)	0.2	g/s	20	g/s		0.12	%
			10	L/min	1000	L/min		0.13	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH1001 Sonic nozzle, Thermal-mass, Differential-pressure, Laminar, Bubble, Variable-area, Piston-prover flowmeters	Laminar flowmeter DHI/VCR-V-Q, DHI/MOLBOX1	In house method: Instrument Calibration Technique for Gas Meter by Low Pressure Gas Flow Calibration System - Master Meter Method /MOLBLOC (0.002 to 40) L/min (Document No.: 07-3-A7-0151)	0.04	mg/s	800	mg/s		0.13	%
			0.002	L/min	40	L/min		0.13	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									

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
KH1001 Sonic nozzle, Thermal-mass, Laminar, Differential-pressure, Variable-area flowmeters	sonic nozzle CMS/SN0448, CMS/SN0583, CMS/SN0836, CMS/SN1190, CMS/SN1757, CMS/-, CMS/-, CMS/-, CMS/-, HIRAI/SN003, HIRAI/SN005, HIRAI/SN008, HIRAI/SN010, HIRAI/SN015, HIRAI/SN020, HIRAI/SN030, HIRAI/SN040, HIRAI/SN060	In house method: Instrument Calibration Technique for Gas Meter by Low Pressure Gas Flow Calibration System (PVTt) - Master Meter Method (Document No.: 07-3-A2-0261)	0.8	mg/s	6000	mg/s	Negative pressure mode	0.12	%
			0.04	L/min	300	L/min	Negative pressure mode	0.13	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH1001 Sonic nozzle, Thermal-mass, Laminar, Differential-pressure, Variable-area flowmeters	Sonic nozzle HIRAI/SN003, HIRAI/SN005, HIRAI/SN008, HIRAI/SN010, HIRAI/SN015, HIRAI/SN020, HIRAI/SN030, HIRAI/SN040, HIRAI/SN060, HIRAI/SN085, HIRAI/SN120, HIRAI/SN170, HIRAI/SN240	In house method: Instrument Calibration Technique for Gas Meter by Low Pressure Gas Flow Calibration System (PVTt) - Master Meter Method (Document No.: 07-3-A2-0261)	0.8	mg/s	6000	mg/s	Postive pressure mode	0.11	%
			0.04	L/min	300	L/min	Postive pressure mode	0.11	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									

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
KH1001 Sonic nozzle, Thermal-mass, Laminar, Piston-prover, Differential-pressure, Variable-area flowmeters	Piston prover DURAN/16.5, DURAN/27.0, DURAN/45.0, DURAN/80.0, DURAN/160.0	In house method: Instrument Calibration Technique for Gas Meter by Low Pressure Gas Flow Calibration System - Piston Prover (0.002 to 40) L/min (Document No.: 07-3-A7-0129)	0.04	mg/s	800	mg/s		0.11	%
			0.002	L/min	40	L/min		0.11	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH1001 Sonic nozzle, Thermal-mass, Laminar, Piston-prover, Differential-pressure, Variable-area flowmeters	Piston prover BROOKS/1050-5	In house method: Instrument Calibration Techniques for Low Pressure Gas Flow Calibration System - Piston Prover Calibrating Meter (Document No.: 07-3-76-0012)	0.04	mg/s	480	mg/s		0.11	%
			0.002	L/min	24	L/min		0.11	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH1002 Coriolis, Positive-displacement, Differential-pressure, Turbine, Ultrasonic, Vortex, Electromagnetic, Variable-area flowmeters	Weighing scale Mettler Toledo /KES1500, Mettler Toledo /KG6000	In house method: Instrument Calibration Techniques for Large Water Flow Calibration System - Weighing Method (Document No.: 07-3-84-0002)	0.5	kg/s	133.3	kg/s		0.05	%
			1.8	m^3/h	480	m^3/h		0.05	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; TSAI, Kun-Chih									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									

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
KH1002 Coriolis, Positive-displacement, Differential-pressure, Turbine, Ultrasonic, vortex, Electromagnetic, Variable-area flowmeters	Weighing scale Mettler Toledo /KCS600	In house method: Instrument Calibration Techniques for Small Water Flow Calibration System - Weighing Method (Document No.: 07-3-85-0092)	0.16	kg/s	11.67	kg/s		0.04	%
			0.6	m^3/h	42	m^3/h		0.04	%
			0.033	kg/s	0.16	kg/s		0.06	%
			0.12	m^3/h	0.6	m^3/h		0.06	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; TSAI, Kun-Chih									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH1002 Thermal-mass, Differential-pressure, Coriolis, Variable-area, Photoelectric switch, Micro flow liquid flowmeters; Liquid metering pump, Syringe pump	Weighing scale Mettler Toledo /AX205	In house method: Instrument Calibration Techniques for Micro Flow Calibration System - Weighing Method (Document No.: 07-3-94-0095)	0.1	mm^3/min	1	mm^3/min		2.0	%
			1	mm^3/min	10	mm^3/min		0.7	%
			10	mm^3/min	100	mm^3/min		0.4	%
			0.1	cm^3/min	1	cm^3/min		0.2	%
			1	cm^3/min	10	cm^3/min		0.3	%
			0.1	mg/min	1	mg/min		2.0	%
			1	mg/min	10	mg/min		0.7	%
			10	mg/min	100	mg/min		0.4	%
			0.1	g/min	1	g/min		0.2	%
			1	g/min	10	g/min		0.3	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; TSAI, Kun-Chih									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH2001 Positive-displacement, Coriolis, Turbine, Ultrasonic, Vortex flowmeters	Sonic nozzle HIRAI/-	In house method: Instrument Calibration Techniques for High Pressure Air-Flow Calibration System - Comparison Method (Document No.: 07-3-86-0115)			< 200	m^3	@ (15 to 12000) m^3/h (standard condition) ; (100 to 6000) kPa; (1 to 60) bar	0.17	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									

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
KH2001 Positive-displacement, Turbine, Ultrasonic, Rotary flowmeters, Vortex flowmeters	Rortary flowmeter Itron / Delta S-Flow G100 Ultrasonic flowmeter SICK / FLOWSIC600-XT, SICK / FLOWSIC600	In house method: Instrument Calibration Technique for High Pressure Gas Flow Calibration System - Comparison Method/Circulating Flow (Document No.: 07-3-B0-0163)	1.25	m^3	7.00	m^3	@ (25 to 140) m^3/h (meter condition) (500 to 5500) kPa; (5 to 55) bar	0.21	%
			1.25	m^3	50.00	m^3	@ (25 to 1000) m^3/h (meter condition) (500 to 5500) kPa; (5 to 55) bar	0.23	%
			33.33	m^3	166.67	m^3	@ (400 to 2000) m^3/h (meter condition) (500 to 5500) kPa; (5 to 55) bar	0.27	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH2001 Positive-displacement, Turbine, ultrasonic, Rotary flowmeters	Gyroscopic scale WOHWA/9631	In house method: Instrument Calibration Techniques for Primary Calibration System of High PressureGas Flow - Gravimetric Method (Document No.: 07-3-83-0042)			< 90	m^3	@ (15 to 4500) m^3/h; (500 to 6000) kPa; (5 to 60) bar	0.13	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									

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
KH2001 Positive-displacement flowmeter	Sonic nozzle HIRAI/SN003, HIRAI/SN005, HIRAI/SN008, HIRAI/SN010, HIRAI/SN015, HIRAI/SN020, HIRAI/SN030, HIRAI/SN040, HIRAI/SN060, HIRAI/SN085, HIRAI/SN120, HIRAI/SN170, HIRAI/SN240	In house method: Instrument Calibration Technique for Gas Meter by Low Pressure Gas Flow Calibration System (PVTt) - Master Meter Method (Document No.: 07-3-A2-0261)			< 3000	L	@ (0.04 to 300) L/min	0.13	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH2001 Positive-displacement flowmeter	Laminar flowmeter DHI/VCR-V-Q, DHI/MOLBOX1	In house method: Instrument Calibration Technique for Gas Meter by Low Pressure Gas Flow Calibration System - Master Meter Method/MOLBLOC (0.002 to 40) L/min (Document No.: 07-3-A7-0151)			< 500	L	@ (0.002 to 40) L/min	0.13	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									

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
KH2001 Positive-displacement flowmeter	Sonic nozzle FLOW SYSTEMS /d=0.204, d=0.100, d=0.049, d=0.024, CMS/-	In house method: Instrument Calibration Technique for Gas Meter by Low Pressure Gas Calibration System - Master Meter Method (Document No.: 07-3-A0-2020)			< 10000	L	@ (10 to 1000) L/min	0.13	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH2002 Coriolis, Positive-displacement, Turbine, Ultrasonic, Vortex, Electromagnetic flowmeters	Weighing scale Mettler Toledo /KES1500, Mettler Toledo /KG6000	In house method: Instrument Calibration Techniques for Large Water Flow Calibration System - Weighing Method (Document No.: 07-3-84-0002)	375	kg	6000	kg	@ (0.5 to 133.3) kg/s	0.04	%
			0.375	m^3	6	m^3	@ (1.8 to 480) m^3/h	0.04	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; TSAI, Kun-Chih									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH2002 Coriolis, Positive-displacement, Turbine, Ultrasonic, Vvortex, Electromagnetic flowmeters	Weighing scale Mettler Toledo /KCS600	In house method: Instrument Calibration Techniques for Small Water Flow Calibration System - Weighing Method (Document No.: 07-3-85-0092)	60	kg	600	kg	@ (0.16 to 11.67) kg/s	0.03	%
			60	L	600	L	@ (0.6 to 42) m^3/h	0.03	%
			20	kg	60	kg	@ (0.033 to 0.16) kg/s	0.06	%
			20	L	60	L	@ (0.12 to 0.6) m^3/h	0.06	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; TSAI, Kun-Chih									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									

calibration items	working standard brand /model	calibration method document name /no.	measurand level or range minimum value	units	maximum value	units	measurement conditions /independent variable explanation	smallest uncertainty value	units
KH2002 Coriolis flowmeter, Liquid metering pump, Syringe pump	Weighing scale Mettler Toledo /AX205	In house method: Instrument Calibration Techniques for Micro Flow Calibration System - Weighing Method (Document No.: 07-3-94-0095)	0.025	cm^3	0.25	cm^3	@ (0.1 to 1) mm^3/min	2.0	%
			0.2	cm^3	2	cm^3	@ (1 to 10) mm^3/min	0.7	%
			0.35	cm^3	3.5	cm^3	@ (10 to 100) mm^3/min	0.4	%
			8.1	cm^3	81	cm^3	@ (0.1 to 1) cm^3/min	0.2	%
			55	cm^3	100	cm^3	@ (1 to 10) cm^3/min	0.3	%
			0.025	g	0.25	g	@ (0.1 to 1) mg/min	2.0	%
			0.2	g	2	g	@ (1 to 10) mg/min	0.7	%
			0.35	g	3.5	g	@ (10 to 100) mg/min	0.4	%
			8.1	g	81	g	@ (0.1 to 1) g/min	0.2	%
			55	g	100	g	@ (1 to 10) g/min	0.3	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; TSAI, Kun-Chih									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH2003 Positive-displacement, Turbine, Coriolis, Ultrasonic flowmeters	Weighing scale Mettler Toledo /KES3000, Mettler Toledo /KG6000	In house method: Instrument Calibration Technique for Low Viscosity Oil Flow System - Weighing Method (Document No.: 07-3-83-0058)	0.47	m^3	7.4	m^3	@ (3.6 to 360) m^3/h	0.05	%
			375	kg	6000	kg	@ (50 to 1800) kg/min	0.04	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; TSAI, Kun-Chih									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									
KH3001 Thermal, Ultrasonic, Differential-pressure, Pitot tube anemometer, Vane anemometer, Laser Doppler velocimetry	Laser Doppler velocimeter DANTEC /Fiber Flow	In house method: Instrument Calibration Techniques for Air Speed Calibration System - LDV Method (Document No.: 07-3-93-0130)	0.2	m/s	60	m/s		0.52	%
Approval Signatory: CHIANG, Chun-Lin; LIN, Win-Ti; LIN, Ying-Chun									
Calibration Site: No.30, Daxue Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)									

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