



Certificate No. : LN0881-201217

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

## Certificate of Accreditation

This is to certify that

**National Measurement Laboratory, R. O. C.**  
**National Measurement Laboratory, R. O. C.(Temperature, Humidity)**  
321, Sec. 2, Kuang Fu Rd., Hsinchu, Taiwan, R.O.C.

**is accredited in respect of laboratory**

**Accreditation Criteria** : ISO/IEC 17025:2017 ; CNS 17025:2018  
**Accreditation Number** : N0881  
**Originally Accredited** : May 15, 2002  
**Effective Period** : May 15, 2021 to May 14, 2026  
**Accredited Scope** : Calibration Field, see described in the Appendix  
**Specific Accreditation Program** : Accreditation Program for National Metrology Institutes

Ching-Chang Lien  
President, Taiwan Accreditation Foundation  
Date : December 17, 2020

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

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Ching-Chang Lien  
President, Taiwan Accreditation Foundation  
Date : December 17, 2020

Accreditation Number : N0881

Laboratory Head : LIN, Tzeng-Yow

## Temperature/Humidity

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	mini mum value	units	maxi mum value	units	explanation	value	units
KE1002 Platinum resistance thermometer, Fixed-point Cell	FLUKE /5960A, ISOTECH /17924, FLUKE /5900E, Hart Scientific /5901A, Hart Scientific /5943, ISOTECH /17668, FLUKE/5904, NML/Sn, ISOTECH /17669, ISOTECH /17671, NML/Al, FLUKE/5907, FLUKE/5908, ISOTECH /17673	Instrument Calibration Technique for the Fixed-Point Calibration of Platinum Resistance Thermometer (Document No.: 07-3-82 -0061)	-190	°C	962	°C	FP of Ag	6.0	mK
			-190	°C	962	°C	FP of Al	4.1	mK
			-190	°C	962	°C	FP of Zn	2.1	mK
			-190	°C	962	°C	FP of Sn	0.52	mK
			-190	°C	962	°C	FP of In	0.85	mK
			-190	°C	962	°C	MP of Ga	0.37	mK
			-190	°C	962	°C	TP of H <sub>2</sub> O	0.16	mK
			-190	°C	962	°C	TP of Hg	0.43	mK
-190	°C	962	°C	TP of Ar	0.81	mK			

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	mini mum value	units	maxi mum value	units	explanation	value	units
KE1002 Resistance thermometer detector, Resistance thermometer, Thermometer containing display meter (Digital thermometer)	ISOTECH 909/25.5, ROSEMOUNT 162CE	Instrument Calibration Technique for Resistance Temperature Thermometer (Document No.: 07-3-82-0060)	-70	°C	<-60	°C		9.0 (0.0090)	mK (°C)
			-60	°C	<-50	°C		7.6 (0.0076)	mK (°C)
			-50	°C	<-40	°C		7.4 (0.0074)	mK (°C)
			-40	°C	<-30	°C		6.8 (0.0068)	mK (°C)
			-30	°C	<-20	°C		7.0 (0.0070)	mK (°C)
			-20	°C	<-10	°C		7.2 (0.0072)	mK (°C)
			-10	°C	<0	°C		6.7 (0.0067)	mK (°C)
			0	°C	0	°C		6.3 (0.0063)	mK (°C)
			>0	°C	10	°C		6.8 (0.0068)	mK (°C)
			>10	°C	20	°C		7.0 (0.0070)	mK (°C)
			>20	°C	30	°C		7.0 (0.0070)	mK (°C)
			>30	°C	40	°C		7.4 (0.0074)	mK (°C)
			>40	°C	50	°C		6.9 (0.0069)	mK (°C)
			>50	°C	60	°C		7.0 (0.0070)	mK (°C)
			>60	°C	70	°C		7.3 (0.0073)	mK (°C)
			>70	°C	80	°C		8.0 (0.0080)	mK (°C)
			>80	°C	100	°C		11 (0.011)	mK (°C)
			>100	°C	150	°C		8.7 (0.0087)	mK (°C)
			>150	°C	200	°C		9.0 (0.0090)	mK (°C)
			>200	°C	250	°C		11 (0.011)	mK (°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
KE1002 Resistance thermometer detector, Resistance thermometer, Thermometer containing display meter (Digital thermometer)	ISOTECH 909/25.5, ROSEMOUNT 162CE	Instrument Calibration Technique for Resistance Temperature Thermometer (Document No.: 07-3-82-0060)	>250	°C	300	°C		18 (0.018)	mK (°C)
KE1004 type R, S, B thermocouple	Hart-5943-09, CMS-Sn-1-05, Fluke-5906-Zn-06116, Fluke-5907-Al-07170, Fluke-5908-Ag-08077	Instrument Calibration Technique for the Fixed-Point Calibration of Noble Metal Thermocouples (Document No.: 07-3-89-0009)	29.7646	°C	29.7646	°C	MP of Ga	0.20	°C
			231.928	°C	231.928	°C	FP of Sn	0.14	°C
			419.527	°C	419.527	°C	FP of Zn	0.13	°C
			660.323	°C	660.323	°C	FP of Al	0.12	°C
			961.78	°C	961.78	°C	FP of Ag	0.11	°C
			0	°C	961.78	°C		0.20	°C
			>961.78	°C	1200	°C		0.41	°C
KE1007 Standard radiation thermometer	Ag: CHINO IR-RO-AG, Cu: CHINO IR-RO-Cu	Instrument Calibration Technique for the Fixed-Point Calibration of Radiation Thermometers (Document No.: 07-3-90-0113)	800	°C	800	°C	650 nm	0.38	°C
			900	°C	900	°C	650 nm	0.30	°C
			1000	°C	1000	°C	650 nm	0.31	°C
			1100	°C	1100	°C	650 nm	0.35	°C
			1200	°C	1200	°C	650 nm	0.37	°C
			1300	°C	1300	°C	650 nm	0.45	°C
			1400	°C	1400	°C	650 nm	0.66	°C
			1500	°C	1500	°C	650 nm	0.89	°C
			1600	°C	1600	°C	650 nm	1.2	°C
			1700	°C	1700	°C	650 nm	1.5	°C
			1800	°C	1800	°C	650 nm	1.8	°C
			1900	°C	1900	°C	650 nm	2.1	°C
			2000	°C	2000	°C	650 nm	2.5	°C
			800	°C	800	°C	900 nm	0.28	°C
			900	°C	900	°C	900 nm	0.24	°C
			1000	°C	1000	°C	900 nm	0.26	°C
			1100	°C	1100	°C	900 nm	0.31	°C
			1200	°C	1200	°C	900 nm	0.34	°C
1300	°C	1300	°C	900 nm	0.41	°C			
1400	°C	1400	°C	900 nm	0.55	°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
KE1007 Standard radiation thermometer	Ag: CHINO IR-RO-AG, Cu: CHINO IR-RO-Cu	Instrument Calibration Technique for the Fixed-Point Calibration of Radiation Thermometers (Document No.: 07-3-90-0113)	1500	°C	1500	°C	900 nm	0.71	°C
			1600	°C	1600	°C	900 nm	0.89	°C
			1700	°C	1700	°C	900 nm	1.1	°C
			1800	°C	1800	°C	900 nm	1.4	°C
			1900	°C	1900	°C	900 nm	1.6	°C
			2000	°C	2000	°C	900 nm	1.9	°C
KE1007 Linear Pyrometer	Ag: CHINO IR-RO-AG, Cu: CHINO IR-RO-Cu	Instrument Calibration Technique for the Fixed-Point Calibration of Radiation Thermometers (Document No.: 07-3-90-0113)	961.78	°C	961.78	°C	(@650 nm) -Ag	0.25	°C
			1084.62	°C	1084.62	°C	(@650 nm) -Cu	0.33	°C
			961.78	°C	961.78	°C	(@900 nm) -Ag	0.25	°C
			1084.62	°C	1084.62	°C	(@900 nm) -Cu	0.30	°C
KE1007 Radiation thermometer	ASL /T100-250-ID	Instrument Calibration Technique for the Comparative Calibration of Room Temperature Radiation Thermometer (Document No.: 07-3-97-0003)	10	°C	90	°C		0.1	°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
KE1007 Radiation thermometer	IKE LP3, LUMASENSE IGA 12	Instrument Calibration Technique for the Comparative Calibration of Radiation Thermometers (Document No.: 07-3-79-0089)	800	°C	900	°C		0.9	°C
			>900	°C	1000	°C		1.1	°C
			>1000	°C	1100	°C		1.2	°C
			>1100	°C	1200	°C		1.4	°C
			>1200	°C	1300	°C		1.5	°C
			>1300	°C	1400	°C		2.0	°C
			>1400	°C	1500	°C		1.9	°C
			>1500	°C	1600	°C		2.1	°C
			>1600	°C	1700	°C		3.1	°C
			>1700	°C	1800	°C		3.4	°C
			>1800	°C	1900	°C		3.8	°C
			>1900	°C	2000	°C		4.0	°C
KE2001 Hygrometer electronic psychrometer, humidity transducer, digital humidity analyzer,	Thunder Scientific 2500ST	Instrument Calibration Technique for Two-Pressure Humidity Generator (2500) Calibration System (Document No.: 07-3-99-5145)	10	%	98	%	relative humidity	(0.0038 ×RH +0.0306)	%RH
			0	°C	<35	°C	Temperature	0.064	°C
			35	°C	<69.5	°C	Temperature	0.12	°C

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	mini mum value	units	maxi mum value	units	explanation	value	units
KE2003 Optical chilled dew point hygrometer	Thunder Scientific 2500ST	Instrument Calibration Technique for Two -Pressure Humidity Generator (2500) Calibration System (Document No.: 07-3-99-5145)	-27	°C	25	°C	Dew point	0.068	°C
			>25	°C	<68	°C	Dew point	0.089	°C

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

### Approval Signatory

Approval Signatory	Scope
KO, Hsin-Yi	KE1002, KE1004, KE1007, KE2001, KE2003
YEH, Chien-Chih	KE1002, KE1004, KE1007, KE2001, KE2003
TSAI, Shu-Fei	KE1002, KE1004, KE1007, KE2001, KE2003
TU, Tsung-Hsien	KE1002, KE1004, KE1007, KE2001, KE2003

(Null Below)