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Registration No. CNAS L1635

Accreditation Criteria: ISO/IEC 17025:2017 and relevant requirements of CNAS

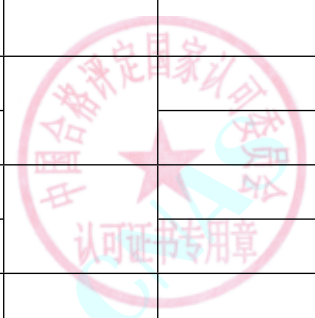
Effective Date: 2022-09-14 Expiry Date: 2024-05-28

CHINA NATIONAL ACCREDITATION SERVICE FOR CONFORMITY ASSESSMENT
SCHEDULE OF ACCREDITATION CERTIFICATE

SCHEDULE 5 ACCREDITED CALIBRATION AND MEASUREMENT CAPABILITY SCOPE

Note: The instruments with * represents onsite calibration can be performed.

No	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
Measuring Equipment for Calibration							
Thermology Measuring Equipment							
1	*the Equipment of the Environmental Testing for Temperature and Humidity	Temperature	Calibration Specification for the Equipment of the Environmental Testing for Temperature and Humidity JJF 1101	(-60~300)°C	U=0.2°C		
		Humidity		(5~98)%RH	U=1.4%RH		
2	Mechanical Thermo-hygrometers	Temperature	Mechanical Thermo-hygrometers JJG 205	(5~50)°C	U=0.4°C		
		Humidity		(30~95)%RH	U=1.7%RH		
3	Digital Temperature-hygrometers	Temperature	C.S. for Digital Temperature-hygrometers JJF 1076	(5~50)°C	U=0.4°C		
		Humidity		10%RH~90%RH	U=1.7%RH		
4	*salt mist testing chambers	Temperature	Calibration Specification for salt mist testing chambers	(-60~300)°C	U=0.2°C (k=2)		



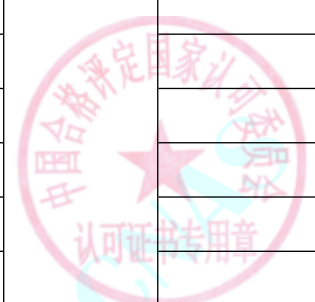
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No	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
		Settlement rate	JJF(辽)75	(1~2)mL/(80cm ² .h)	U=0.1mL/(80cm ² .h)		
5	Industry Platinum and Copper Resistance Thermometers	temperature	Industry Platinum and Copper Resistance Thermometers JJG 229	(0~300)°C	U=0.032°C		
6	Base Metal Thermocouples	temperature	Calibration Specification for Base Metal Thermocouples JJF 1637	(300~1200)°C	U=0.84°C		
7	Temperature Indicators	temperature	Calibration Specification for Temperature Indicators JJF 1664	(0~1100)°C	U=0.64°C		
Electromagnetic Measuring Equipment							
1	*Multimeters	DC voltage	Calibration Specification for Multimeters JJF 1587	(20~200)mV	U=5×10 ⁻⁶ V _X +0.1 μV		
				(0.2~2)V	U=3.5×10 ⁻⁶ V _X +0.5 μV		
				(2~20)V	U=3.5×10 ⁻⁶ V _X +5 μV		
				(20~200)V	U=5×10 ⁻⁶ V _X +50 μV		
				(200~1000)V	U=5×10 ⁻⁶ V _X +0.6mV		
		AC voltage		(30~200)mV/(40~100)Hz	U=1.3×10 ⁻⁴ V _X +4.6 μV		
				(30~200)mV/(100~2k)Hz	U=1.2×10 ⁻⁴ V _X +2.3 μV		
				(30~200)mV/(2~10)kHz	U=1.2×10 ⁻⁴ V _X +4.6 μV		
				(30~200)mV/(10~30)kHz	U=3.5×10 ⁻⁴ V _X +9.2 μV		
				(0.2~2)V/(40~100)Hz	U=1×10 ⁻⁴ V _X +23 μV		
(0.2~2)V/(100~2k)Hz	U=7.5×10 ⁻⁵ V _X +23 μV						

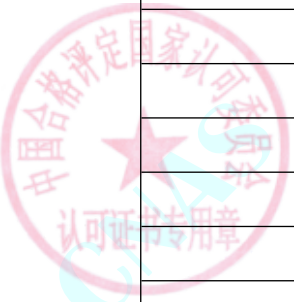


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				(0.2~2)V/(2~10)kHz	$U=1 \times 10^{-4}V_X+23 \mu V$		
				(0.2~2)V/(10~30)kHz	$U=2.4 \times 10^{-4}V_X+46 \mu V$		
				(2~20)V/(40~100)Hz	$U=1 \times 10^{-4}V_X+0.23mV$		
				(2~20)V/(100~2k)Hz	$U=7.5 \times 10^{-5}V_X+0.23mV$		
				(2~20)V/(2~10)kHz	$U=1 \times 10^{-4}V_X+0.23mV$		
				(2~20)V/(10~30)kHz	$U=2.4 \times 10^{-4}V_X+0.46mV$		
				(20~200)V/(40~100)Hz	$U=1 \times 10^{-4}V_X+2.3mV$		
				(20~200)V/(100~2k)Hz	$U=7.5 \times 10^{-5}V_X+2.3mV$		
				(20~200)V/(2~10)kHz	$U=1 \times 10^{-4}V_X+2.3mV$		
				(20~200)V/(10~30)kHz	$U=2.4 \times 10^{-4}V_X+4.6mV$		
				(200~1000)V/(40~10k)Hz	$U=1 \times 10^{-4}V_X+23mV$		
				(200~1000)V/(10~30)kHz	$U=2.4 \times 10^{-4}V_X+46mV$		
				DC current	(100~200) μA	$U=1.4 \times 10^{-5}I_X+0.5nA$	
		(0.2~2)mA	$U=1.4 \times 10^{-5}I_X+5nA$				
		(2~20)mA	$U=1.5 \times 10^{-5}I_X+50nA$				
		(20~200)mA	$U=4.2 \times 10^{-5}I_X+0.9 \mu A$				
		(0.2~2)A	$U=2 \times 10^{-4}I_X+18 \mu A$				
		(2~20)A	$U=4.4 \times 10^{-4}I_X+0.5mA$				
		AC current	(100~200) μA /(60~10k)Hz	$U=5.5 \times 10^{-4}I_X+23nA$			



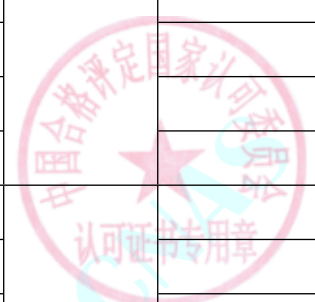
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No	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
			C.S. for Clamp Ammeters JJF 1075	(0.2~2)mA/(60~10k)Hz	$U=3.2 \times 10^{-4} I_X + 0.23 \mu A$		
				(2~20)mA/(60~10k)Hz	$U=3.2 \times 10^{-4} I_X + 2.3 \mu A$		
				(20~200)mA/(60~10k)Hz	$U=2.9 \times 10^{-4} I_X + 23 \mu A$		
				(0.2~2)A/(60~2k)Hz	$U=6.9 \times 10^{-4} I_X + 0.23 mA$		
				(0.2~2)A/(2~10)kHz	$U=8.2 \times 10^{-4} I_X + 0.23 mA$		
				(2~20)A/(60~2k)Hz	$U=9.2 \times 10^{-4} I_X + 2.3 mA$		
				(2~20)A/(2~10)kHz	$U=2.9 \times 10^{-3} I_X + 2.3 mA$		
		DC resistance		(10~20) Ω	$U=1 \times 10^{-5} R_X + 16 \mu \Omega$		
				(20~200) Ω	$U=8.7 \times 10^{-6} R_X + 58 \mu \Omega$		
				(0.2~2)k Ω	$U=8.7 \times 10^{-6} R_X + 0.58 m \Omega$		
				(2~20)k Ω	$U=8.7 \times 10^{-6} R_X + 5.8 m \Omega$		
				(20~200)k Ω	$U=8.7 \times 10^{-6} R_X + 58 m \Omega$		
				(0.2~2)M Ω	$U=1 \times 10^{-5} R_X + 1.2 \Omega$		
				(2~20)M Ω	$U=1.7 \times 10^{-5} R_X + 0.12 k \Omega$		
				(20~200)M Ω	$U=6.9 \times 10^{-5} R_X + 12 k \Omega$		
				(0.2~1)G Ω	$U=6 \times 10^{-4} R_X + 1.2 M \Omega$		
				2	Clamp Ammeter		
AC Current	20A~1000A	$U_{rel}=0.7\%$					
5mA~20A,50Hz	$U_{rel}=0.2\%$						

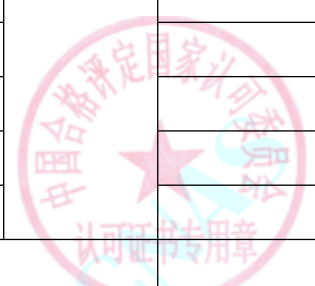


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				20A~1000A,50Hz	$U_{rel}=0.9\%$		
3	D.C. Resistance box	DC Resistance	V.R. of D.C. Resistance Box JIG 982	0.1 Ω ~1 Ω	$U_{rel}=0.12\%$		
				1 Ω ~10 Ω	$U_{rel}=0.024\%$		
				10 Ω ~100 Ω	$U_{rel}=0.01\%$		
				100 Ω ~10M Ω	$U_{rel}=0.003\%$		
4	Electronic Insulation Resistance Meter	Resistance	V.R. of Electronic Insulation Resistance Meters JJG 1005	(0.1~10)M Ω	$U_{rel}=0.24\%$		
				(10~100) M Ω	$U_{rel}=0.6\%$		
				100M Ω ~1G Ω	$U_{rel}=1.2\%$		
				(1~10)G Ω	$U_{rel}=2.4\%$		
		(10~100)G Ω		$U_{rel}=6\%$			
		Voltage		(50~5000)V	$U_{rel}=2.4\%$		
5	Digital AC Electrical Parameters Meter	AC Voltage	C.S. for Digital AC Electrical Parameters Meter JJF 1491	(10~1000)V,50Hz	$U_{rel}=0.15\%$		
		AC Current		10mA~20A,50Hz	$U_{rel}=0.15\%$		
		AC Power		30W~6kW,50Hz	$U_{rel}=0.2\%$		
		Frequency		(10~1000)Hz	$U_{rel}=0.2\%$		
		Power Factor		0.2~0.6	$U=0.003$		
				0.6~1.0	$U=0.002$		
Measuring equipment for calibration							
Mechanical measuring equipment							

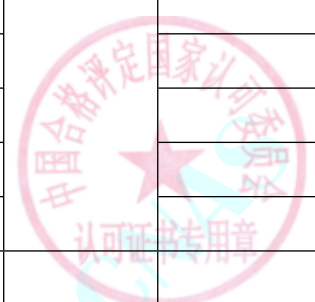


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No	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
1	*Analogue Indicating Weighing Instruments	quality	Analogue Indicating Weighing Instruments JJG 13	10g~5kg	$U=(0.02\sim0.2)g$		
				(>5~10) kg	$U=(0.02\sim0.2)g$		
				(>10~100) kg	$U=(0.8\sim8)g$		
2	*Equipment of Power Measuring	torque	Calibration Specification of Chassis Dynamometers for Automobile Emissions	(5~5133)Nm	$U_{rel}=0.14\%$		
				(≥5133~8000) N.m	$U_{rel}=0.14\%$		
		rotate speed	Testing JJF 1221, Equipment of Power Measuring JJG 653	(50~10000)r/min	$U_{rel}=0.12\%$		
				(10001~20000) r/min	$U_{rel}=0.12\%$		
3	*Working Dynamometers	Force value	Working Dynamometers JJG 455	1N~200kN	$U_{rel}=0.12\%$		
4	*Digital Indicating Weighing Instruments	quality	Digital Indicating Weighing Instruments JJG 539	10g~5kg	$U=(0.03\sim0.3)g$		
				(>5~10)kg	$U=(0.4\sim1)g$		
				(>10~100)kg	$U=(1\sim10)g$		
5	*Elastic Element Precise Pressure Gauges and Vacuum Gauges	pressure	Elastic Element Precise Pressure Gauges and Vacuum Gauges JJG 49	(-0.1~0)MPa	$U=0.13kPa$		
				(>0~1)MPa	$U=0.82kPa$		
				(>1~2.5)MPa	$U=2.9kPa$		
				(>2.5~10)MPa	$U=8.2kPa$		
				(>10~40)MPa	$U=0.034MPa$		
				(>40~70)MPa	$U=0.072MPa$		
6	*Elastic Element Pressure Gauges, Pressure-Vacuum	pressure	Elastic Element Pressure Gauges, Pressure-Vacuum Gauges and Vacuum Gauges	(-0.1~0)MPa	$U=0.27kPa$		
				(>0~1)MPa	$U=2.8kPa$		

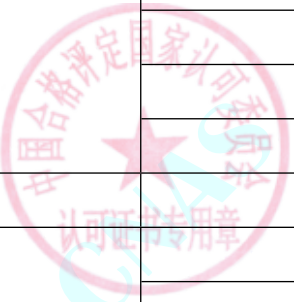


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No	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
	Gauges and Vacuum Gauges for General Use		for General Use JJG 52	(>1~2.5)MPa	U=6.3kPa		
				(>2.5~10)MPa	U=0.02MPa		
				(>10~40)MPa	U=0.09MPa		
				(>40~70)MPa	U=0.19MPa		
7	*Digital Pressure Gauges	pressure	Digital Pressure Gauges JJG 875	(>0~1)MPa	U=0.6kPa		
				(>1~6)MPa	U=3.7kPa		
				(>6~30)MPa	U=0.02MPa		
				(>30~70)MPa	U=0.05MPa		
8	*Tyre Pressure Gauges	pressure	Tyre Pressure Gauges JJG 927	(0~0.1)MPa	U=0.23kPa		
				(>0.1~0.25)MPa	U=0.78kPa		
				(>0.25~0.6)MPa	U=1.6kPa		
				(>0.6~1.6)MPa	U=4.1kPa		
9	Pieoelectric Accelerometer	Sensitivity	Pieoelectric Accelerometer JJG 233	(10~5000)Hz、(0.1~100)m/s ²	U _{rel} =2%		
10	Weights	Mass	Verification Regulation Of Weights JJG 99	1 kg	U=11 mg		
				5kg	U=16 mg		
				10kg	U=59 mg		
				20kg	U=0.12 g		



No	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
				25kg	U=0.15 g		
11	*Electronic Balance	Mass	Calibration Specification for Electronic Balance JJF 1847	1 mg~1 g	U= (6.6~36) μg		
				1 g~1 kg	U=36 μg~1.9 mg		
				(1~10)kg	U= (1.9~6.0) mg		
				(10~40)kg	U= (6.0~78) mg		
12	Aneroid Barometer & Aneroid Barograph	Pressure	Verification Regulation of Aneroid Barometer & Aneroid Barographs JJG 272	(800~1060) hPa	U=0.3hPa		
13	Digital Barometers	Pressure	Verification Regulation of Digital Barometers JJG 1084	(0~1200) hPa	U=0.16hPa		
14	Locomotive Pipette	Volume	Verification Regulation of Locomotive Pipette JJG 646	(10~100) μL	U _{rel} =0.8%		
				>100 μL~1 mL	U _{rel} =0.4%		
				(>1~10) mL	U _{rel} =0.2%		
15	Working Glass Container	Volume	Verification Regulation of Working Glass Container JJG 196	(0.1~1) mL	U=2.4 μL		
				(>1~10) mL	U=14 μL		
				(>10~100) mL	U=39 μL		
				(>100~250) mL	U=0.10 mL		
				(>250~2000) mL	U=0.20 mL		
Special test for motor vehicles measuring equipment							
1	*Tester for Tyre Strength and Bead Unseating	Force	Calibration Specification of Tester for Tyre Strength and Bead Unseating Resistance	(0.5~100)kN	U _{rel} =0.22%		
		Indenter displacement		(0~400)mm	U=0.64mm		



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№	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
	Resistance	Indentation speed	JJF 1194	(50±2.5)mm/min	$U_{rel}=0.32\%$		
2	*Drum Tester for Tyre Endurance and High Speed Test	Force	Calibration Specification of Drum Tester for Tyre Endurance and High Speed Test JJF 1195	(0.5~60)kN	$U_{rel}=0.18\%$		
		speed		(30~320)km/h	$U_{rel}=0.16\%$		
		Radial runout		(0~10)mm	$U=0.03\text{mm}$		
3	Motor Vehicle Testers for Steering Force and Steering Angle	Steering torque	Calibration Specification of Motor Vehicle Testers for Steering Force and Steering Angle JJF 1196	(0.1~200)Nm	$U_{rel}=0.86\%$		
		Steering angle		(-1440~-0.1)°、(0.1~1440)°	$U_{rel}=0.38\%$		
4	Manipulating Force Tester for Automotive Brake	Brake pedal force/hand pull force	Calibration Specification for Manipulating Force Tester for Automotive Brake JJF 1169	(0.1~1500)N	$U_{rel}=0.38\%$		
5	*Fuel Flowmeter	flow	Calibration Specifications for Vehicle Fuel Flowmeter JJF(机械) 1046	(0.1~250)L/h	$U_{rel}=0.6\%$		
6	Dummy force sensor	Force Value	Calibration Specification for Multi-component Force Transducer JJF 1560	(1~25)kN	$U_{rel}=0.08\%$		
				(0.0001~1×10 ⁴)mV/V	$U_{rel}=0.53\%$		
		Torque		(1~2000)N.m	$U_{rel}=0.5\%$		
				(0.0001~1×10 ⁴)mV/V	$U_{rel}=1\%$		
7	*Vehicle comprehensive performance tester	time	Calibration specification for Vehicle comprehensive performance tester JJF (机械) 1017	(0~+∞)s	$U=0.01\text{s}$		
		speed		(5~300)km/h	$U=0.06\text{km/h}$		
		distance		(0.0001~+∞)m	$U_{rel}=0.14\%$		
8	*Vehicle Exhaust Emissions Measuring	Gas Concentration	Verification Regulation of Vehicle Exhaust Emissions Measuring Instruments	HC: (1~9999)×10 ⁻⁶	$U_{rel}=1.3\%$		



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	Instruments		JJG688	CO:(0.01~16.00)×10 ⁻²	U _{rel} =1.0%		
				CO ₂ : (0.1~18.0) ×10 ⁻²	U _{rel} =1.0%		
				O ₂ :(0.1~25.0)×10 ⁻²	U _{rel} =1.0%		
				NO:(1~5000)×10 ⁻⁶	U _{rel} =1.1%		
9	*Opacimeters	Optical absorption ratio	Verification Regulation of Opacimeters JJG 976	(0~98.6) %	U=0.8%		
10	*Motor Vehicle Engine Speed Measuring Instruments	speed of revolution	Calibration Specification for Motor Vehicle Engine Speed Measuring Instruments JJF1375	(200~10000)r/min	U _{rel} =0.4%		
Chemistry measuring equipment							
1	*Gas Chromatographs	Limit of Detection	Verification Regulation of Gas Chromatographs JJG 700	FID: ≤0.5ng/s	U _{rel} =10%		
				ECD: ≤5pg/mL	U _{rel} =7%		
				FPD: ≤0.5ng/s (S) , ≤0.1ng/s(P)	U _{rel} =8%		
				NPD: ≤5pg/s (N) , ≤10pg/s(P)	U _{rel} =9%		
		Sensitivity		TCD: ≥800mV · mL/mg	U _{rel} =8%		
2	*Liquid Chromatographs	Minimum Detectable Concentration	Verification Regulation of Liquid Chromatographs JJG 705	VWD: ≤5 × 10 ⁻⁸ g/mL	U _{rel} =9%		
				DAD: ≤5 × 10 ⁻⁸ g/mL	U _{rel} =9%		
				FLD: ≤5 × 10 ⁻⁹ g/mL	U _{rel} =8%		
				RID: ≤5 × 10 ⁻⁶ g/mL	U _{rel} =8%		

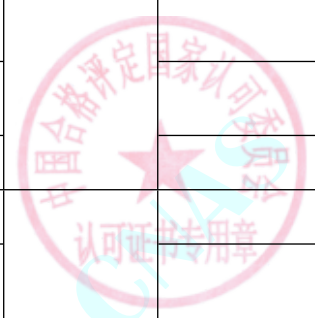


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No	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
				ELSD: $\leq 5 \times 10^{-6} \text{g/mL}$	$U_{\text{rel}}=9\%$		
3	*Gas Chromatograph-Mass Spectrometries	Signal-Noise Ratio	Calibration Specification for Gas Chromatograph-Mass Spectrometries JJF 1164	$\geq 10:1$	$U_{\text{rel}}=15\%$		
4	*Liquid Chromatograph-Mass Spectrometers	Signal-Noise Ratio	Calibration Specification for Liquid Chromatograph-Mass Spectrometers JJF 1317	Triple four-stage rod (ESI+, APCI+) : $\geq 30:1$	$U_{\text{rel}}=10\%$		
				Triple four-stage rod (ESI-) : $\geq 10:1$	$U_{\text{rel}}=10\%$		
				Single four-stage rod (ESI+, APCI+, ESI-) : $\geq 10:1$	$U_{\text{rel}}=10\%$		
				Ion trap (ESI+, APCI+, ESI-) : $\geq 10:1$	$U_{\text{rel}}=10\%$		
5	*X-Ray Fluorescence Spectrometers	Content	Calibration Specification for Energy Dispersive X-Ray Fluorescence Spectrometers JJF (Fujian) 1047	Cr: (90~1200) mg/kg	$U_{\text{rel}}=4\%$		
6	Laboratory pH Meters	pH	Verification Regulation of Laboratory pH Meters JJG 119	Electric meter part: pH(0.000~14.000)	$U=0.012$		
		Voltage		Instrument part: pH(4.000~10.000)	$U=0.016$		
				(-2000~2000)mV	$U=0.58\text{mV}$		
7	*Ultraviolet, Visible Spectrophotometers	Wavelength	Verification Regulation of Ultraviolet, Visible, Near-Infrared Spectrophotometers JJG 178	(220~807)nm	$U=0.8 \text{ nm}$		
		Transmittance		(8~90)%	$U=0.5\%$		



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