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

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SCHEDULE 5 ACCREDITED CALIBRATION AND MEASUREMENT CAPABILITY SCOPE

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

No	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
几何量						
1	Gauge Block	Length	V.R. of Gauge Blocks JJG146	(0.5~1000)mm	$U=0.08\mu\text{m}+1\times 10^{-6}L$ ($k=2.7$)	
2	Micrometer	Length	V.R. of Micrometer JJG21	(0~250)mm	$U=1\mu\text{m}$	
				(250~500)mm	$U=2\mu\text{m}$	
3	Large Dimension Outside Micrometers	Length	C. S for Micrometers with Measuring Range from 500mm to 3000mm JJF1088	(500~3000)mm	$U=3.5\mu\text{m}+5.2\times 10^{-6}L$	
4	Current Calipers	Length	V.R. of Current Calipers JJG30	div0.02mm,(0~1000)	$U=0.012\text{mm}$	
				div0.05mm,(0~1000) mm	$U=0.03\text{mm}$	
				div0.10mm,(0~1000) mm	$U=0.06\text{mm}$	
				digital(0~1000) mm	$U=0.012\text{mm}$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
5	Dial Gauges (dial and digital)	length	V.R. of Dial Gauges(dial and digital) JJG34	Dial 0.01mm(0~10)mm	$U=5 \mu m$	
				Dial 0.001mm (0~5)mm	$U=2 \mu m$	
				Digital 0.01mm (0~10)mm	$U=9 \mu m$	
				Digital 0.001mm (0~10)mm	$U=3 \mu m$	
6	Steel Tape	Length	V.R. of Steel Tape JJG4	(0~5)m	$U=0.2mm$	
				>(5~20)m	$U=0.4mm$	
				>(20~30)m	$U=0.5mm$	
				>(30~50)m	$U=0.6mm$	
				>(50~100)m	$U=0.8mm$	
7	Steel Ruler	Length	V.R. of Steel Ruler JJG1	(0~2000)mm	$U=0.04mm+0.03 \times 10^{-3}L$	
8	*Length Measuring Machine	Length	C.S. for Length Measuring Machine JJF1066	dm: (100~3000)mm	$U=0.7 \mu m+10^{-6}L$	
				mm : (0~100)mm	$U=0.34 \mu m+1.6 \times 10^{-6}L$	
				μm : (-100~100) μm	$U=0.07 \mu m$	
9	*Toolmaker's Microscope	Length	V.R. of Toolmaker's Microscope JJG56	$\leq (200 \times 100)mm$	$U=0.2 \mu m+0.34 \times 10^{-6}L$	
10	*Optimeter	Length	V.R. of Optimeter JJG45	(0~150) mm	$U=0.07 \mu m$	
11	*Contact-Type Interferometers	Length	V.R. of Contact-Type Interferometers JJG101	(0~180) mm	$U=0.01 \mu m$	
12	*Tester for Dial Indicator Gauges	Length	V.R. of Tester for Dial Indicator Gauges JJG201	Raster indicator verification instrument: (0~10)mm	$U=0.3 \mu m$	
				Raster indicator verification instrument: (10~50)mm	$U=0.13 \mu m+18 \times 10^{-6}L$	



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				Tester for 0.001mm: (0~5)mm	$U=0.2 \mu m$	
				Tester for 0.01mm: (0~25)mm	$U=0.3 \mu m$	
13	*Ultrasonic Thickness Instruments	Length	C.S. for Ultrasonic Thickness Instruments JJF1126	(Resolution:0.01mm) $\leq 15mm$	$U=0.02mm$	
				(Resolution:0.01mm) $>$ (15~75)mm	$U=0.03mm$	
				(Resolution:0.01mm) $>$ (75~200) mm	$U=0.06mm$	
				(Resolution:0.1mm) $\leq 75mm$	$U=0.06mm$	
				(Resolution:0.1mm) $>$ (75~200) mm	$U=0.12 mm$	
14	**Coordinate Measuring Machines	Length	C.S. for Coordinate Measuring Machines JJF1064	(0~2)m	$U=0.18 \mu m+0.36 \times 10^{-6}L$	
				(2~3)m	$U=0.12 \mu m+1.6 \times 10^{-6}L$	
15	*Calibrators for the Levels	Angle	V.R. of Calibrators for the Levels JJG191	(0.002~1.5)mm/m	$U_{rel}=1.9\%$	
16	Electronic Levels	Angle	V.R.of Electronic Levels and Coincidence Levels JJG103	(-0.5~+0.5)mm/m	$U=0.001mm/m$	
				(-5~+5)mm/m	$U=0.01mm/m$	
17	Coincidence Levels	Angle	V.R.of Electronic Levels and Coincidence Levels JJG103	(-1~+1)mm/m	$U=0.002mm/m$	
				(-5~+5)mm/m	$U=0.003mm/m$	



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18	*Contact(Stylus)Instruments of Surface Roughness Measurement by the Profile Method	Roughness	C.S for Contact(Stylus)Instruments of Surface Roughness Measurement by the Profile Method JJF1105	Ra:(0.025~10) μm	$U_{\text{rel}}=3\%$	
19	Roughness Comparison Specimens	Roughness	C.S. of Roughness Comparison Specimens JJF1099	Ra:(0.025~25) μm	$U_{\text{rel}}=6\%$	
20	*Surface Plates	Flatness	V.R.of Surface Plates JJG117	$\leq (400 \times 400)\text{mm}$	$U=1.0 \mu\text{m}$	
				$(630 \times 400)\text{mm} \sim (1600 \times 1000)\text{mm}$	$U=2.2 \mu\text{m}$	
				$(1600 \times 1000)\text{mm} \sim (2500 \times 1600)\text{mm}$	$U=2.9 \mu\text{m}$	
21	Internal Micrometers	Length	V.R.of Internal Micrometers JJG22	$(0 \sim 1000)\text{mm}$	$U=1.0 \mu\text{m} + 3.4 \times 10^{-6}L$	
22	Micrometers of Measuring Inside Dimension	Length	C.S.for Micrometers of Measuring Inside Dimension JJF1411	$(0 \sim 300) \text{mm}$	$U=1.0 \mu\text{m} + 5 \times 10^{-6}L$	
23	Feel Gauges	Length	V.R.of Feel Gauges JJG62	$\leq 0.10\text{mm}$	$U=1.4 \mu\text{m}$	
				$(0.10 \sim 3.00)\text{mm}$	$U=2.5 \mu\text{m}$	
24	Universal Bevel Protractors	Angle	V.R.of Universal Bevel Protractors JJG33	div $2'$: $0^\circ \sim 360^\circ$	$U=1.1'$	
				div $5'$: $0^\circ \sim 360^\circ$	$U=2.9'$	
25	Frame Levels and Shaft Levels	Angle	C.S. for Frame Levels and Shaft Levels JJF1084	$\pm 1.5\text{mm/m}$	$U_{\text{rel}}=5.8\%$	
26	*Projectors	Length	C.S.for Projectors JJF1093	$(0 \sim 200)\text{mm}$	$U=0.72 \mu\text{m} + 7 \times 10^{-6}\ln$	
27	*Length Measuring Instrument	Length	C.S.for Length Measuring Instrument JJF1189	$< 100\text{mm}$	$U=0.034 \mu\text{m} + 1.6 \times 10^{-6}L$	



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				$(\geq 100 \sim 1000)\text{mm}$	$U=0.01 \mu\text{m}+1.8 \times 10^{-6}L$	
28	* Height Measuring Instrument with Digital Display	Length	C.S. for Height Measuring Instrument with Digital Display JJF1254	$(0 \sim 1000)\text{mm}$	$U=0.32 \mu\text{m}+1.5 \times 10^{-6}L$	
29	Inductive Micrometers	Length	C.S. for Inductive Micrometers JJF1331	division $0.1 \mu\text{m}:(-1 \sim +1)\text{mm}$	$U=0.07 \mu\text{m}$	
				division $0.5 \mu\text{m}:(-1 \sim +1)\text{mm}$	$U=0.18 \mu\text{m}$	
				division $1 \mu\text{m}:(-1 \sim +1)\text{mm}$	$U=0.27 \mu\text{m}$	
				division $5 \mu\text{m}:(-1 \sim +1)\text{mm}$	$U=0.8 \mu\text{m}$	
				division $10 \mu\text{m}:(-1 \sim +1)\text{mm}$	$U=1.6 \mu\text{m}$	
30	Wide Range Gauges in 0.01mm	Length	V.R. of Wide Range Gauges in 0.01mm JJG379	$(0 \sim 50)\text{mm}$	$U=11 \mu\text{m}$	
				$(0 \sim 100)\text{mm}$	$U=7 \mu\text{m}$	
31	* Biological Microscopes	Length	C.S. for Biological Microscopes JJF1402	$(0.01 \sim 1)\text{mm}$	$U_{\text{rel}}=1.2\%$	
32	Pile Displacement Sensor	Length	C.S. for the Pile Displacement Sensor JJF (Ji) 83	$(-10 \sim +40)\text{mm}$	$U=0.01\text{mm}$	
33	Cylindrical Measuring Pin	Length	C.S. for Cylindrical Measuring Pin JJF1207	$(0.1 \sim 25)\text{mm}$	$U=0.4 \mu\text{m}$	
34	Tire Tread Depth Gauge	length	C.S. for Tire Tread Depth Gauge JJF1477	digital $(0 \sim 30)\text{mm}$	$U=0.01\text{mm}$	
				vernier $(0 \sim 50)\text{mm}$	$U=0.03\text{mm}$	
35	Plain Limit Gauges	length	V.R. of Plain Limit Gauges JJG343	Plug gauge $(1 \sim 300)\text{mm}$	$U=0.22 \mu\text{m}+4 \times 10^{-3}L$	
				Ring gauge $(2 \sim 200)\text{mm}$	$U=0.6 \mu\text{m}+1 \times 10^{-3}L$	
36	* Thickness Gauges	length	C.S. for Thickness Gauges JJF1255	$(0 \sim 1)\text{mm}$	$U=1.7 \mu\text{m}$	



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			ilac-MRA CHINA NATIONAL ACCREDITATION SERVICE FOR CONFORMITY ASSESSMENT SCHEDULE OF ACCREDITATION CERTIFICATE	Pointer 0.001mm: (0~10)mm	$U=3 \mu m$	
				(0~30)mm	$U=5 \mu m$	
				(0~10)mm	$U=3 \mu m$	
				(0~30)mm	$U=7 \mu m$	
37	Test Sieves	length	C.S. for Test Sieves JJF1175	(0.020~5)mm	$U=0.002mm$	
				(5~125)mm	$U=0.03mm$	
38	Linear Displacement Sensors	length	C.S. for Linear Displacement Sensors JJF1305	(0.1~2000)mm	$U_{rel}=0.08\%$	
39	Angular-Position Transducers/Sensors	Angle	C.S. for Angular-Position Transducers/Sensors JJF1352	(0.01~360)°	$U_{rel}=0.08\%$	
40	Wedge-shape Filler Gauges	length	C.S. for Wedge-shape Filler Gauges JJF1548	I type : (0.05~60)mm	$U=9 \mu m$	
				II type: (0.05~15)mm	$U=11 \mu m$	
				digimatic: (0.05~40)mm	$U=10 \mu m$	
41	Cylindrical Thread Gauges	Length	C.S. for Cylindrical Thread Gauges JJF1345	Plug Gauge(3~160)mm	$U=2.9 \mu m+5 \times 10^{-6}L$	
				Ring Gauge(3~160)mm	$U=3.4 \mu m+5 \times 10^{-6}L$	
42	Ring Gauge	length	V.R. of Standard Ring Gauge JJG894	(1~200)mm	$U=0.6 \mu m+1 \times 10^{-3}L$	
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1	Bimetallic Thermometers	temperature	Verification Regulation of Bimetallic thermometers JJG226	(-30~90)°C	$U=0.3^{\circ}C$	
				(100~300)°C	$U=0.4^{\circ}C$	
2	Filled System Thermometers	temperature	Verification Regulation of Filled System Thermometers JJG310	(-30~300)°C	$U=0.2^{\circ}C$	



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3	Liquid-in-Glass Thermometers for Petroleum Products	temperature	V.R. of Liquid-in-Glass Thermometers for Working JJG130	(-30~100)°C	$U=0.05^{\circ}\text{C}$	
				(100~300)°C	$U=0.06^{\circ}\text{C}$	
4	*Calibration Specification of the Temperature Transmitter	temperature	Calibration Specification of the Temperature Transmitter JJF1183	(4~20)mA	$U=0.020\text{mA}$	
5	*Electric Resistance Furnace	temperature	Calibration Specification for Box-type Resistance Furnace JJF1376	(300~400)°C	$U=1.8^{\circ}\text{C}$	
				(500~800)°C	$U=2.0^{\circ}\text{C}$	
				(900~1100)°C	$U=2.2^{\circ}\text{C}$	
				(1100~1200)°C	$U=2.4^{\circ}\text{C}$	
6	Working Noble Metal Thermometer	temperature	Verification Regulation of Working Noble Metal Thermometer JJG141	419.527°C	$U=0.63^{\circ}\text{C}$	
				660.323°C	$U=0.68^{\circ}\text{C}$	
				1084.62°C	$U=0.60^{\circ}\text{C}$	
7	The Working Radiation Thermometers	temperature	Verification Regulation of the Working Radiation Thermometers below 500°C JJG856	室温~ 500°C	$U=2.2^{\circ}\text{C}$	
				(500~800)°C	$U=4.1^{\circ}\text{C}$	
				(800~1000)°C	$U=5.0^{\circ}\text{C}$	
				(1000~1600)°C	$U=6.1^{\circ}\text{C}$	
8	Industrial Resistance Thermistor	temperature	V.R. of Industrial Platinum and Copper Resistance Thermometers JJG229	0°C	$U=0.023^{\circ}\text{C}$	
				100°C	$U=0.035^{\circ}\text{C}$	
9	Standard Platinum Resistance thermometer	temperature	V.R. of Standard Platinum Resistance Thermometer JJG160	0.01°C	$U=0.0020^{\circ}\text{C}$	
				231.928°C	$U=0.0044^{\circ}\text{C}$	

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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
				419.527℃	$U=0.0060^{\circ}\text{C}$	
10	Standard Platinum - Rhodium10/platinum Thermocouple	temperature	V.R. of the Standard Platinum Rhodium 10/Platinum Thermocouple JJG75	419.527℃	$U=0.62^{\circ}\text{C}$	
				660.323℃	$U=0.67^{\circ}\text{C}$	
				1084.62℃	$U=0.59^{\circ}\text{C}$	
11	*Digital Temperature Indicators and Controllers	temperature	V.R. of Digital Temperature Indicators and Controllers JJG617	(-200~800)℃	$U=0.1^{\circ}\text{C}$	
				(0~1300)℃	$U=0.3^{\circ}\text{C}$	
12	Standard Mercury-in-Glass Thermometer	temperature	V.R. of Standard Mercury-in-Glass Thermometer JJG161	(-60~100)℃	$U=0.03^{\circ}\text{C}$	
				(100~300)℃	$U=0.04^{\circ}\text{C}$	
13	*Digital Indicators and Controllers	temperature	V.R. of Digital Temperature Indicators and Controllers JJG617	(-200~1600)℃	$U_{\text{rel}}=0.06\%$	
		pressure		(-0.1~250)MPa	$U_{\text{rel}}=0.06\%$	
14	*Working Base Metal Thermometer	temperature	V.R. of Working Base Metal Thermometer JJG351	(300~1100)℃	$U=0.5^{\circ}\text{C}$	
15	Liquid-in-Glass Thermometers	Temperature	V.R. of Liquid-in-Glass Thermometers for Working JJG130	(-30~100)℃	$U=0.05^{\circ}\text{C}$	
				(100~300)℃	$U=0.06^{\circ}\text{C}$	
16	*High temperature disinfection sterilization devices	temperature	Calibration Specification for High temperature disinfection sterilization devices of Specification parameters JJF(Ji)29	(0~150)℃	$U=0.28^{\circ}\text{C}$	
				(0~400)℃	$U=0.62^{\circ}\text{C}$	
17	*The Equipment of the Environmental Testing	Temperature	Calibration Specification for the Equipment of the Environmental Testing for Temperature and Humidity JJF1101	(-60~0)℃	$U=0.6^{\circ}\text{C}$	
				(0~100)℃	$U=0.4^{\circ}\text{C}$	
				(100~300)℃	$U=0.6^{\circ}\text{C}$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (k=2)	Note
		Relative humidity		(5~99)%RH	U=1.3%RH	
18	Temperature Indication Controller	temperature	V.R. of Temperature Indication Controller JJG874	(-30~300)℃	U=0.1℃	
19	*Temperature Itinerant Detecting Instrument	temperature	Calibration Specification for Thermometer Itinerant Detecting Instrument JJF1171	(-60~300)℃	U=0.1℃	
20	*Open/Closed Cup Flash Point Testers	Temperature	C.S. for Open/Closed Cup Flash Point Testers JJF1384	(70.8~232.2)℃	U=(4.6~8.2)℃	
21	*The temperature Block Calibrators	Temperature	Calibration Guideline of the Temperature Block Calibrators JJF1257	(-50~1100)℃	U=0.3℃	
22	*Temperature Data Acquisition Instruments	Temperature	C.S. of Temperature Data Acquisition Instruments JJF1366	(-60~500)℃	U=0.015℃	
23	*Thermostatic Bath	Temperature	Measurement and Test Norm of Thermostatic Bath's Metrological Characteristics JJF1030	uniformity(-50~400)℃	U=0.003℃	
				fluctuation(-50~400)℃	U=0.005℃	
24	*Thermocouple Calibration Furnaces	Temperature	Testing Specification of Temperature Uniformity in Thermocouple Calibration Furnaces JJF1184	(300~1100)℃	U=0.25℃	
25	safety barrier	current	V.R. of safety barrier JJG(FSM) 8	(4~20)mA	U _{rel} =0.011%	
		Voltage		(1~5)V	U=0.0003V	
力学						
1	Weight	Mass	V.R. of Weights JJG99	F1: (1~500)mg	U=(0.003~0.009)mg	
				F1: (1~500)g	U=(0.01~0.4)mg	



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			ilac-MRA CHINA NATIONAL ACCREDITATION SERVICE FOR CONFORMITY ASSESSMENT SCHEDULE OF ACCREDITATION CERTIFICATE	F1: (1~20)kg	$U=(0.8\sim 26)\text{mg}$	
				F2: (1~500)mg	$U=(0.007\sim 0.03)\text{mg}$	
				F2: (1~500)g	$U=(0.03\sim 0.9)\text{mg}$	
				F2: (1~20)kg	$U=(3\sim 42)\text{mg}$	
				M1: (1~500)mg	$U=(0.007\sim 0.03)\text{mg}$	
				M1: (1~500)g	$U=(0.03\sim 0.9)\text{mg}$	
				M1: (1~20)kg	$U=5\text{mg}\sim 0.1\text{g}$	
2	Digital Indicating Weighing Instrument	Mass	V.R. of Digital Indicating Weighing Instrument JJG539	(0~2.5)kg	$U=1.2\text{g}$	
				(2.5~10)kg	$U=1.4\text{g}$	
				(10~15)kg	$U=3\text{g}$	
				(15~30)kg	$U=3.0\text{g}$	
				(30~100)kg	$U=7\text{g}$	
				(100~500)kg	$U=0.07\text{kg}$	
				(500~2000)kg	$U=0.4\text{kg}$	
				(2~10)t	$U=0.7\text{kg}$	
				(10~30)t	$U=3\text{kg}$	
3	Mechanical Balance	Mass	V.R. of Mechanical Balance JJG98	(0~20)g $d=0.01\text{mg}$	$U=(0.0023\sim 0.008)\text{mg}$	
				(0~200)g $d=0.1\text{mg}$	$U=(0.014\sim 5.8)\text{mg}$	
				(0~20)kg $d>0.1\text{mg}$	$U=(0.024\sim 5.8)\text{mg}$	



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4	Electronic Balance	Mass	V.R. of Electronic Balance JJG1036	(0~50)g	$U=0.016\text{mg}$	
				(50~200)g	$U=0.18\text{mg}$	
				(200~220)g	$U=0.20\text{mg}$	
				(220~410)g	$U=3.2\text{mg}$	
				410g~1kg	$U=16\text{mg}$	
5	General Volumetric Glass	Capacity	V.R. of Working Glass Container JJG196	(0.1~0.5)mL	$U=0.001\text{ mL}$	
				(>0.5~2)mL	$U=0.002\text{mL}$	
				(>2~10)mL	$U=0.004\text{mL}$	
				(>10~25)mL	$U=0.006\text{ mL}$	
				(>25~50)mL	$U=0.010\text{mL}$	
				(>50~100)mL	$U=0.020\text{ mL}$	
				(>100~250)mL	$U=0.04\text{mL}$	
				(>250~500)mL	$U=0.14\text{mL}$	
				(>500~1000)mL	$U=0.18\text{ mL}$	
6	Quantitative Adjustable Bipet	Capacity	V.R. of Locomotive Pipette JJG646	(1~2) μL	$U_{\text{rel}}=4.0\%$	
				(>2~10) μL	$U_{\text{rel}}=2.8\%$	
				(>10~25) μL	$U_{\text{rel}}=1.5\%$	
				(>25~40) μL	$U_{\text{rel}}=1.1\%$	



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			ilac-MRA CHINA NATIONAL ACCREDITATION SERVICE FOR CONFORMITY ASSESSMENT SCHEDULE OF ACCREDITATION CERTIFICATE	(>40~50) μ L	$U_{rel}=1.0\%$	
				(>50~100) μ L	$U_{rel}=0.70\%$	
				(>100~200) μ L	$U_{rel}=0.49\%$	
				(>200~300) μ L	$U_{rel}=0.39\%$	
				(>300~500) μ L	$U_{rel}=0.32\%$	
				(>500~1000) μ L	$U_{rel}=0.26\%$	
				(>1000~10000) μ L	$U_{rel}=0.19\%$	
7	Standard Dynamometer	Force	V.R. of Standard Dynamometer JJG144	20N~1000kN	$U_{rel}=0.11\%$	
				0.2MN~10MN	$U_{rel}=0.32\%$	
8	*Universal Tension and Compression Testing Machine	Force	V.R. of Universal Tension and Compression Testing Machine JJG139	(0.1~2000)kN	$U_{rel}=0.4\%$	
9	*Torque Wrench	Torque	V.R. of Torque Wrenches JJG707	(0.2~1000) N·m	$U_{rel}=1.0\%$	
10	Metallic Brinell Hardness Testers	Hardness	V.R. of Metal Brinell Hardness Tester JJG150	≤ 125 HBW	$U_{rel}=2.0\%$	
				(125~225)HBW	$U_{rel}=1.5\%$	
				>225HBW	$U_{rel}=1.3\%$	
11	Metallic Rockwell Hardness Testers	Hardness	V.R. of Metallic Rockwell Hardness Testers JJG112	(20~30)HRC	$U=0.79$ HRC	
				(35~55)HRC	$U=0.62$ HRC	
				(60~70)HRC	$U=0.52$ HRC	
				(20~88)HRA	$U=0.52$ HRA	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
				(20~100)HRBW	$U=0.86\text{HRBW}$	
12	Metallic Vickers Hardness Testers	Hardness	V.R. of Metal Vickers Hardness Tester JJG151	$\leq 225\text{HV}$ (HV5、HV10、HV20、HV30、HV50、HV100)	$U_{\text{rel}}=3.0\%$	
				$> 225\text{HV}$ (HV5、HV10、HV20、HV30、HV50、HV100)	$U_{\text{rel}}=2.1\%$	
				$\leq 225\text{HV}$ (HV0.2、HV0.3、HV0.5、HV1)	$U_{\text{rel}}=5.3\%$	
				$> 225\text{HV}$ (HV0.2、HV0.3、HV0.5、HV1)	$U_{\text{rel}}=4.2\%$	
				$\leq 225\text{HV}$ (HV0.05、HV0.1)	$U_{\text{rel}}=5.4\%$	
				$> 225\text{HV}$ (HV0.05、HV0.1)	$U_{\text{rel}}=5.1\%$	
13	Hot bulb anemometer	Wind speed	V.R. of Hot bulb anemometer JJG (MOC) 0001	(0.2~30)m/s	$U_{\text{rel}}=0.36\%$	
14	Micro-Sampling Syring	Capacity	Calibration Specification of Micro-Sampling Syring JJF (Ji) 59	(0.25~0.5) μL	$U_{\text{rel}}=6.6\%$	
				(>0.5~2) μL	$U_{\text{rel}}=4.7\%$	
				(>2~10) μL	$U_{\text{rel}}=2.6\%$	
				(>10~25) μL	$U_{\text{rel}}=1.3\%$	
				(>25~50) μL	$U_{\text{rel}}=1.0\%$	
				(>50~100) μL	$U_{\text{rel}}=0.7\%$	
				(>100~250) μL	$U_{\text{rel}}=0.5\%$	
				(>250~1000) μL	$U_{\text{rel}}=0.3\%$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
15	Second-Class Standard densimeter	Density	V.R. of Standard Glass Hydrometers JJG86	(650~1000)kg/m ³	$U=0.18 \text{ kg/m}^3$	
				(1000~1500)kg/m ³	$U=0.20 \text{ kg/m}^3$	
16	Second-Class Standard Petroleum densimeter	Density	V.R. of Standard Glass Hydrometers JJG86	(650~900)kg/m ³	$U=0.16 \text{ kg/m}^3$	
				(900~1100)kg/m ³	$U=0.19 \text{ kg/m}^3$	
17	Second-Class Standard alcoholi- meter	Density	V.R. of Standard Glass Hydrometers JJG86	(0~100)%	$U=0.1\%$	
18	Densimeter	Density	V.R. of Working Glass Hydrometers JJG42	(650~1000)kg/m ³	$U=0.3 \text{ kg/m}^3$	
				(1000~1800)kg/m ³	$U=0.4 \text{ kg/m}^3$	
19	Petroleum densimeter	Density	V.R. of Working Glass Hydrometers JJG42	(650~950)kg/m ³	$U=0.22 \text{ kg/m}^3$	
				(960~1100)kg/m ³	$U=0.3 \text{ kg/m}^3$	
20	Alcoholi-meter	Density	V.R. of Working Glass Hydrometers JJG42	(0~100)%	$U=0.5\%$	
21	*Infusion Pumps	flow	C.S.for Syringe Pumps and Infusion Pumps JJF1259	(5~19.9)mL/h	$U_{\text{rel}}=3\%$	
				(20~200)mL/h	$U_{\text{rel}}=2.0\%$	
				(201~1000)mL/h	$U_{\text{rel}}=3\%$	
		block pressure		(0~200)kPa	$U=2.5 \text{ kPa}$	
22	*Syringe Pumps	flow	C.S.for Syringe Pumps and Infusion Pumps JJF1259	(5~19.9)mL/h	$U_{\text{rel}}=2.5\%$	
				(20~200)mL/h	$U_{\text{rel}}=2.0\%$	
				(201~1000)mL/h	$U_{\text{rel}}=3\%$	
		pressure		(0~200)kPa	$U=2.5 \text{ kPa}$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (<i>k</i> =2)	Note
23	Piezoelectric Accelerometer	acceleration	V.R. of Piezoelectric Accelerometer JJG233	160Hz: (1~300)m/s ²	<i>U</i> _{rel} =1.0%(ref)	
				(20~2000)Hz: (1~300)m/s ²	<i>U</i> _{rel} =2.0%(otther frequenc)	
24	Dynamic Elastic Modulus Measurement Instruments	Resonance frequency	Calibration Specification for Dynamic Elastic Modulus Measurement Instruments JJF1373	10Hz~10kHz	<i>U</i> _{rel} =0.4%	
25	Coriolis Mass flow meters	mass	V.R. of Goriolis Mass flow meters JJG1038	(quality method)1000kg	<i>U</i> _{rel} =0.07%	1.0class and below
		flow		(quality method)(0.02~600)t/h	<i>U</i> _{rel} =0.07%	
				(standard scale)(1~1700)m ³ /h	<i>U</i> _{rel} =0.3%	
				(standard scale)(1~6000)m ³ /h	<i>U</i> _{rel} =0.3%	
26	*Ultrasonic Flowmeter	flow	V. R. of Ultrasonic Flowmeters JJG1030	(quality method)(0.02~600)t/h	<i>U</i> _{rel} =0.07%	liquid
				(standard scale) (1~1700)m ³ /h DN(20~400)	<i>U</i> _{rel} =0.26%	
				(standard scale)(1700~10000)m ³ /h DN(400~2000)	<i>U</i> _{rel} =0.66%	
				(standard scale)(1~6000)m ³ /h (gas)	<i>U</i> _{rel} =0.3%	
27	*Electromagnetic Flowmeters	flow	V.R. of Electromagnetic Flowmeters JJG1033	(quality method)(0.02~600)t/h	<i>U</i> _{rel} =0.07%	liquid
				(ultrasonic standard scale)(1~1700)m ³ /h DN(20~400)	<i>U</i> _{rel} =0.26%	



№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
				(standard scale)(1700~10000)m ³ /h DN(400~2000)	$U_{rel}=0.66\%$	
28	*Rotor Flowmeter	Flow	V.R. of Rotor meter JJG257	gas(0.003~9.0)m ³ /h liquid(0.01~60)m ³ /h	$U_{rel}=0.3\%$ $U_{rel}=0.5\%$	gas
29	Liquid Positive Displacement Flow Meter	Flow	V.R. of Liquid Positive Displacement Flow Meter JJG667	(0.01~60)m ³ /h	$U_{rel}=0.07\%$	0.2 class and below
30	Heat meter	temperature difference flow	V.R. of Heat Meters JJG225	(3~90)°C (0.03~500)m ³ /h	$U=0.02\text{ }^{\circ}\text{C}$ $U_{rel}=0.2\%$	
31	Gas Displacement Meters	flow	V.R. of Gas Displacement Meters JJG633	(1~6000)m ³ /h	$U_{rel}=0.3\%$	
32	Vortex-shedding Flowmeter	flow	V.R. of Vortex-shedding Flowmeter JJG1029	(standard scale)(1~6000)m ³ /h	$U_{rel}=0.3\%$	gas
33	Cold Water Meter	flow	V.R. of Cold Water Meter JJG162	(1~1700)m ³ /h DN(15~400)	$U_{rel}=0.3\%$	
34	*Fuel Dispenser	Capacity	V.R. of Fuel Dispensers JJG443	20L 100L	$U_{rel}=0.1\%$ $U_{rel}=0.1\%$	
35	*Verification Facility for Water Meters	Capacity	V.R. of Verification Facility for Water Meters JJG1113	(10~5000)L	$U_{rel}=0.09\%$	0.2 class and below
36	standard metal tank of grade 2	capacity	V.R. of standard metal tank JJG259	(10~1000)L	$U_{rel}=0.01\%$	
37	standard metal tank of grade 3	capacity	V.R. of standard metal tank JJG259	(10~5000)L	$U_{rel}=0.04\%$	
38	Tank Cars Capacity	Capacity	V.R. of Tank Cars Capacity JJG133	(1~100)m ³	$U_{rel}=0.1\%$	
39	Standard Bell Provers of Gas Flow	Volume	V.R. of Standard Bell Provers of Gas Flow JJG165	(10~2000)L	$U_{rel}=0.05\%$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
40	*tortuous tube micromanometers	pressure	V.R. of Tilting Tube Micromanometers JJG172	(0~50)Pa	$U=0.6\text{Pa}$	
				(50~600)Pa	$U=3\text{Pa}$	
41	Bourdon tube precise pressure gauge	pressure	V.R. of Elastic Element Precise Pressure Gauges and Vacuum Gauges JJG49	(-0.1~0.16)MPa	$U=0.07\text{kPa}$	
				(0.16~0.25)MPa	$U=0.2\text{kPa}$	
				(0.25~0.6)MPa	$U=0.3\text{kPa}$	
				(0.6~1.6)MPa	$U=0.001\text{MPa}$	
				(1.6~2.5)MPa	$U=0.002\text{MPa}$	
				(2.5~6)MPa	$U=0.003\text{MPa}$	
				(6~16)MPa	$U=0.007\text{MPa}$	
				(16~25)MPa	$U=0.02\text{MPa}$	
				(25~60)MPa	$U=0.03\text{MPa}$	
42	*Bourbon tube pressure gauge, pressure - vacuum gauge and vacuum gauge for general use	pressure	V. R of Elastic Element Pressure Gauges, Pressure. Vacuum Gauges and Vacuum Gauges for General Use JJG52	(-0.1~0)MPa	$U=0.0013\text{MPa}$	
				(0~0.25)MPa	$U=0.003\text{MPa}$	
				(0.25~1)MPa	$U=0.005\text{MPa}$	
				(1~2.5)MPa	$U=0.02\text{MPa}$	
				(2.5~10)MPa	$U=0.1\text{MPa}$	
				(10~25)MPa	$U=0.3\text{MPa}$	
				(25~60)MPa	$U=0.5\text{MPa}$	
43	*Pressure transducer	voltage	V.R. of the Pressure Transducer(Static) JJG860	(0.0001~30)V	$U_{\text{rel}}=0.008\%$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
				(0.0001~75)mV	$U_{rel}=0.008\%$	
		current		(0.0001~30)mA	$U_{rel}=0.012\%$	
44	Piston pressure Gauge	pressure	V.R. of Piston Gauge JJG59	(0.04~250)MPa	$U_{rel}=0.017\%$	
45	Standard Piston Pressure Vacuum Gauge(Grade II & III)	pressure	V.R. of Piston Pressure Vacuum Gauges JJG236	(-0.1~-0.01)MPa	$U_{rel}=0.017\%$	
				(0.01~0.6)MPa	$U_{rel}=0.017\%$	
46	Standard Compensated Micro-manometer	Pressure	V.R. of Standard Compensated Micro-manometer JJG158	(-2500~2500)Pa	$U=0.6\text{Pa}$	
47	Sloped Tube Micro-manometer	Pressure	V.R. of Tilting Tube Micromanometers JJG172	(-2000~-2)Pa	$U_{rel}=0.16\%$	
				(2~2000)Pa	$U_{rel}=0.16\%$	
48	*Digital Pressure Gauge	Pressure	V.R. of Digital Pressure Gauges JJG875	(-0.1~0)MPa	$U=0.001\text{MPa}$	
				(0.002~250)MPa	$U_{rel}=0.007\%$	
49	*Pressure Transmitter	Pressure	V.R. of Pressure Transmitters JJG882	(-0.1~250)MPa	$U_{rel}=0.06\%\text{FS}$	
50	*Buoy Type Oxygen Inhaler	flow	V.R. of Buoy Type Oxygen Inhaler JJG913	(1~10)L/min	$U=0.3\text{L/min}$	
		flow		(0~25)MPa	$U=0.2\text{MPa}$	
51	*Self-contained open-circuit compressed air breathing apparatus	Pressure	Calibration Specification for Self-contained open-circuit compressed air breathing apparatus JJF(Ji)35	(0~35)MPa	$U=0.2\text{MPa}$	
				(0~3.5)MPa	$U=0.018\text{MPa}$	
				(-5~5)kPa	$U=10\text{Pa}$	
52	*Flow integrator	temperature	V.R. of Flow integrator JJG1003	(-80~300)°C	$U_{rel}=0.07\%$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (k=2)	Note
		pressure		(0.001~10)MPa	U _{rel} =0.23%	
		flow		(0.01~10 ⁵)m ³ /h	U _{rel} =0.14%	
53	Aneroid Barometer and Aneroid Barograph	pressure	V.R.of Aneroid Barometer and Aneroid Barograph JJG272	absolute pressure (80~106)kPa	U=0.06kPa	
54	*Engine test System	Pressure	V.R. of Pressure Transmitters JJG882,Calibration Specification for Temperature Itinerant Dctecting Instrument JJF1171,V. R. of differential pressure type flowmotor JJG640	(-0.1~1.6)MPa	U=0.0007MPa	
		Temperature		(0~200)℃	U=0.3℃	
				(0~500)℃	U=1.4℃	
		Flow		(1.5~ 75)L/min	U=15L/min	
55	*Linear Compression Internal Compression Testing Machine	Pressure	C.S. for Linear Compression Internal Compression Testing Machine JJF(Ji)75	(0~6)MPa	U=0.0015MPa	
56	Electronic Downhole Pressure Gauge	Pressure	C.S. for Electronic Downhole Pressure Gauge JJF(Ji)74	(0~30)MPa	U=0.007MPa	
				(30~ 60)MPa	U=0.015MPa	
		Temperature		(0~200)℃	U=0.27℃	
57	*The Concrete Content Measuring Instrument	Pressure	C.S. for The Concrete Content Measuring Instrument JJF (Ji) 91	Pressure gauge: (0~250)kPa	U=2kPa	
				Digital display : (0~250)kPa	U=0.3kPa	
		Capacity		(0~7)L	U=12mL	
58	*The Theoretical Maximum Density of Asphalt Mixture	Pressure	C.S. for The Theoretical Maximum Density of Asphalt Mixture? JJF (Ji) 90	Gage pressure: (-100~0)kPa	U=0.3kPa	
				Absolute pressure: (0~100)kPa	U=0.3kPa	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (<i>k</i> =2)	Note
59	*Pressure Regulators	Pressure	C.S. for Pressure Regulators with Bourdon Tube Pressure Gauge JJF1328	(0～ 15)MPa	<i>U</i> =0.2 δ (δ 为压力表最小分度值)	
60	*Pressure Controllers	Pressure	V.R. of Pressure Controllers JJG544	(-0.1～60)MPa	<i>U</i> =0.023%FS	
声学						
1	Sound Calibrators	Sound pressure level	V.R. of Sound Calibrator JJG176	(94～124)dB, (20～16000)Hz	<i>U</i> =(0.08～0.13)dB	
		Frequency		(20～16000)Hz	<i>U</i> _{rel} =0.3%	
		Total distortion		0.01%～90%	<i>U</i> _{rel} =0.1%～5%	
2	Ultrasonic Flow detectors	Attenuation error	V.R. of Ultrasonic Flaw detectors JJG746	(0～60)dB	<i>U</i> =0.3dB	
		linear error		(0～60)dB	<i>U</i> =1.8%	
3	Audiometers	RETSPL	V.R. of Pure-tone Audiometers JJG388	(0～110)dB, 125Hz	<i>U</i> =0.8dB	
				(0～110)dB, (250～4000) Hz	<i>U</i> =0.7dB	
				(0～110)dB, 6000Hz	<i>U</i> =0.8dB	
				(0～110)dB, 8000Hz	<i>U</i> =1.1dB	
		RETFL		(0～70)dB, 250Hz	<i>U</i> =1.5dB	
				(0～70)dB, 500Hz	<i>U</i> =1.3dB	
				(0～70)dB, 750Hz	<i>U</i> =1.5dB	
				(0～70)dB, 1000Hz	<i>U</i> =1.4dB	
				(0～70)dB, 1500Hz	<i>U</i> =1.5dB	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
			ilac-MRA CHINA NATIONAL ACCREDITATION SERVICE FOR CONFORMITY ASSESSMENT SCHEDULE OF ACCREDITATION CERTIFICATE	(0~70)dB, 2000Hz	$U=1.5\text{dB}$	
				(0~70)dB, 3000Hz	$U=1.5\text{dB}$	
				(0~70)dB, 4000Hz	$U=1.4\text{dB}$	
				(0~70)dB, 6000Hz	$U=2.5\text{dB}$	
				(0~70)dB, 8000Hz	$U=2.5\text{dB}$	
4	Ultrasonic Source for Ultrasonic Doppler Fetal Monitors	Average sound intensity	V.R. of Ultrasonic Source for Ultrasonic Doppler Fetal Monitors JJG394	$\leq 10\text{mW/cm}^2$	$U_{\text{rel}}=12\%$	
5	Sound Level Meters	SPL	V.R. of Sound Level Meters JJG188	pressure field 80dB~130dB, 10Hz~400Hz	$U=(0.3\sim0.5)\text{dB}$	
				free field: 80dB~130dB, 500Hz~20000Hz	$U=(0.3\sim0.6)\text{dB}$	
6	Ultrasonic Source for Medical Ultrasonic Diagnostic Equipment	Output sound intensity	V.R. of Ultrasonic Source for Medical Ultrasonic Diagnostic Equipment JJG639	$\leq 10\text{mW/cm}^2$	$U_{\text{rel}}=12\%$	
7	Acoustic Detectors	Time of transmitted sound	V.R. of Acoustic Detector JJG990	(20~500)mm	$U_{\text{rel}}=0.5\%$	
电磁学						
1	D.C Resistance Box	Resistance	V.R. of DC Resistance Box JJG982	$(10^{-3}\sim10^{-2})\Omega$	$U_{\text{rel}}=3\%$	
				$(0.01\sim0.1)\Omega$	$U_{\text{rel}}=1\%$	
				$(0.1\sim1)\Omega$	$U_{\text{rel}}=0.3\%$	
				$(1\sim10)\Omega$	$U_{\text{rel}}=6\times10^{-4}$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (k=2)	Note
				(10~100) Ω	U _{rel} =1×10 ⁻⁴	
				(100~10 ⁶) Ω	U _{rel} =3×10 ⁻⁵	
2	Standard Resistance	Resistance	V.R. of DC Resistors JJG166	10 ⁻³ Ω、10 ⁻² Ω、10 ⁵ Ω	U _{rel} =7×10 ⁻⁶	
				10 ⁻¹ Ω、10 Ω、10 ² Ω、10 ³ Ω、10 ⁴ Ω	U _{rel} =4×10 ⁻⁶	
				1 Ω	U _{rel} =3×10 ⁻⁶	
3	High Voltage Electrostatic Voltmeter	Voltage	V.R. of High Voltage Electrostratic voltmeter JJG494	(10~5000)V	U _{rel} =3×10 ⁻³	
4	D.C. Potentiometer	Voltage	V.R. of DC Potentiometers JJG123	0.01 μ V~2.1111110V	U _{rel} =4×10 ⁻⁶	
5	current Transformer	ratio	V.R. of Current Transformers of Measuring Service JJG313	rated primary current:(5~5000)A, rated secondary current:5A, Percentage of rated current:5%	U _{rel} =0.46%	
				rated primary current:(5~5000)A, rated secondary current:5A, Percentage of rated current:20%~120%	U _{rel} =0.24%	
		phase difference		phase difference:(-999.99 ~ 999.99)', percentage of rated current:5%	U=1.5'	
				phase difference:(-999.99 ~ 999.99)', percentage of rated current:20%~120%	U=0.72'	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (<i>k</i> =2)	Note
6	Voltage Transformer	ratio	V.R. of Voltage Transformers of Measuring Service JJG314	rated primary voltage:(3,6,10)kV,rated secondary voltage:100V,percentage of rated voltage:20%	<i>U</i> _{rel} =0.46%	
				rated primary voltage:(3,6,10)kV,rated secondary voltage:100V,percentage of rated voltage:50%	<i>U</i> _{rel} =0.34%	
				rated primary voltage:(3,6,10)kV,rated secondary voltage:100V,percentage of rated voltage:80%~120%	<i>U</i> _{rel} =0.24%	
		phase difference		phase difference:(-999.99 ~ 999.99)',percentage of rated voltage:20%	<i>U</i> =1.4 '	
				phase difference:(-999.99 ~ 999.99)',percentage of rated voltage:50%	<i>U</i> =1.1 '	
				phase difference:(-999.99 ~ 999.99)',percentage of rated voltage:80%~120%	<i>U</i> =0.72 '	
7	Electrical Energy Meters	Watt-Hour(single-phase)	V.R. of Electrical Meters for Measuring Alternating-current Wlectrical Energy JJG596,V.R. of Reference Meters for Electrical Energy JJG1085	voltage:220V,current: (0.1 ~ 100)A,power factor:1.0, 0.5(L),0.5(C), 0.25(L)	<i>U</i> _{rel} =0.02%	
		Watt-Hour(three phase balanced load)		voltage:(57.7~380)V, current:(0.1~100)A,power factor:1.0,0.5(L), 0.8(C)	<i>U</i> _{rel} =0.012%	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (<i>k</i> =2)	Note
				voltage:(57.7~380)V, current:(0.1~100)A,power factor:0.5(C)	<i>U</i> _{rel} =0.018%	
		Watt-Hour(three phase unbalanced load)		voltage:(57.7~380)V, current:(0.1~100)A,power factor:1.0	<i>U</i> _{rel} =0.012%	
				voltage:(57.7~380)V, current:(0.1~100)A,power factor:0.5(L)	<i>U</i> _{rel} =0.018%	
8	*Verification Equipment for AC Electrical Energy Meters	Watt-Hour	V.R. of Verification Equipment for AC Electrical Energy Meters JJG597	220V (0.1~100)A, (cos ϕ =1.0, 0.1I _b ~ I _{max} ; cos ϕ =0.5(L)、 0.8(C), 0.5I _b ~ I _{max})	<i>U</i> _{rel} =0.012%	
		Watt-Hour		three phase balanced load,3 × (57.7~380)V,3× (0.1~ 100)A,(cos ϕ 1.0, 0.1I _b ~ I _{max} ;cos ϕ =0.5(L)、 0.8(C), 0.5I _b ~ I _{max})	<i>U</i> _{rel} =0.012%	
9	Digital Multimeter	DC Voltage	C.S. for JJF1587 Digital Multimeter	(20~220)mV	<i>U</i> =0.0008%×Reading+0.4 μ V	
				30mV~2.2V	<i>U</i> =0.0005%×Reading+0.7 μ V	
				(2.2~22)V	<i>U</i> =0.0004%×Reading+4 μ V	
				(22~220)V	<i>U</i> =0.00055%×Reading+40 μ V	
				(220~1100)V	<i>U</i> =0.0007%×Reading+0.4mV	
		DC Curent		(50~220) μ A	<i>U</i> =0.0050%×Reading+6nA	
				220 μ A~2.2mA	<i>U</i> =0.0040%×Reading+7nA	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (<i>k</i> =2)	Note
		DC Curent	ilac-MRA CHINA NATIONAL ACCREDITATION SERVICE FOR CONFORMITY ASSESSMENT SCHEDULE OF ACCREDITATION CERTIFICATE	(2.2~22)mA	<i>U</i> =0.0040%×Reading+40nA	
				(22~220)mA	<i>U</i> =0.0050%×Reading+0.7 μ A	
				220mA~2.2A	<i>U</i> =0.0080%×Reading+12 μ A	
				(2.2~10)A	<i>U</i> =0.04%×Reading+0.48mA	
				10 Ω ,19 Ω	<i>U</i> _{rel} =3×10 ⁻⁵	
				100 Ω ~190k Ω	<i>U</i> _{rel} =1.1× 10 ⁻⁵	
				(1~1.9)M Ω	<i>U</i> _{rel} =2.5× 10 ⁻⁵	
		AC Voltage		10M Ω	<i>U</i> _{rel} =5× 10 ⁻⁵	
				100mV~2.2V(40Hz~20kHz)	<i>U</i> =0.010%× <i>V</i> _x +8 μ V	
				(2.2~22)V(40Hz~20kHz)	<i>U</i> =0.006%×Reading+50 μ V	
				22V~220V(40Hz~20kHz)	<i>U</i> =0.008%×Reading+0.6mV	
				(220~1000)V(50Hz~1kHz)	<i>U</i> =0.010%×Reading+3.5mV	
		AC Curent		1kHz~20kHz: (220~1000)V	<i>U</i> =0.020%×Reading+6mV	
				(100~220) μ A(40Hz~1kHz)	<i>U</i> =0.025%×Reading+8nA	
				220 μ A~2.2mA(40Hz~1kHz)	<i>U</i> =0.02%×Reading+35nA	
				(2.2~22)mA(40Hz~1kHz)	<i>U</i> =0.02%×Reading+0.35 μ A	
				(22~220)mA(40Hz~1kHz)	<i>U</i> =0.02%×Reading+2.5 μ A	
				220mA~2.2A(40Hz~1kHz)	<i>U</i> =0.03%×Reading+35 μ A	



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No	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (k=2)	Note
			 CHINA NATIONAL ACCREDITATION SERVICE FOR CONFORMITY ASSESSMENT SCHEDULE OF ACCREDITATION FOR ELECTRICAL CALIBRATION	(2.2~10)A(40Hz~1kHz)	$U=0.05\% \times \text{Reading} + 0.17\text{mA}$	
				(100~220) μ A(1kHz~5kHz)	$U=0.035\% \times \text{Reading} + 12\text{nA}$	
				220 μ A~2.2mA(1kHz~5kHz)	$U=0.025\% \times \text{Reading} + 0.11 \mu \text{ A}$	
				(2.2~22)mA (1kHz~5kHz)	$U=0.025\% \times \text{Reading} + 0.55 \mu \text{ A}$	
				(22~220)mA(1kHz~5kHz)	$U=0.025\% \times \text{Reading} + 3.5 \mu \text{ A}$	
				220mA~2.2A(1kHz~5kHz)	$U=0.050\% \times \text{Reading} + 80 \mu \text{ A}$	
				(2.2~10)A (1kHz~5kHz)	$U=0.10\% \times \text{Reading} + 0.38\text{mA}$	
				10	thermodynamic instrumentation calibrator	
220mV~2.2V	$U=0.005\% \times \text{Reading} + 0.7 \mu \text{ V}$					
(2.2~22)V	$U=0.004\% \times \text{Reading} + 4 \mu \text{ V}$					
(22~220)V	$U=0.0055\% \times \text{Reading} + 40 \mu \text{ V}$					
DC Voltage(output)	(20~200)mV	$U=0.009\% \times \text{Reading} + 0.1 \mu \text{ V}$				
	200mV~20V	$U=0.0045\% \times \text{Reading} + 0.4 \mu \text{ V}$				
	(20~100)V	$U=0.009\% \times \text{Reading} + 40 \mu \text{ V}$				
DC Current(measurement)	(100~ 220) μ A	$U=0.0060\% \times \text{Reading} + 6\text{nA}$				
	220 μ A~2.2mA	$U=0.0050\% \times \text{Reading} + 7\text{nA}$				
	(2.2~22)mA	$U=0.0050\% \times \text{Reading} + 40\text{nA}$				
	(22~220)mA	$U=0.0060\% \times \text{Reading} + 0.7 \mu \text{ A}$				



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
		DC Current(output)	ilac-MRA SCHEDULE OF ACCREDITATION CERTIFICATE	(2~20)mA	$U=0.0060\% \times \text{Reading} + 4\text{nA}$	
				(20~200)mA	$U=0.006\% \times \text{Reading} + 1 \mu\text{A}$	
		DC resistance(measurement)		10 Ω ~100k Ω	$U_{\text{rel}}=0.03\%$	
				(10~200) Ω	$U=0.008\% \times R + 0.2\text{m}\Omega$	
		DC resistance(output)		200 Ω ~2k Ω	$U=0.008\% \times R + 2\text{m}\Omega$	
				(2~20)k Ω	$U=0.008\% \times R + 20\text{m}\Omega$	
				(20~200)k Ω	$U=0.008\% \times R + 0.2\Omega$	
		Frequency		10Hz~100kHz	$U_{\text{rel}}=0.002\%$	
11	Alternating-direct Voltmeter	DC voltage	V.R. of Amperemeter Voltmeter Wattmeter and Ohmmeter JJG124	75mV~750V	$U_{\text{rel}}=0.02\%$	
				75mV~750V (45Hz~400Hz)	$U_{\text{rel}}=0.02\%$	
		AC voltage		75mV~750V (400Hz~1000Hz)	$U=0.06\% \times V_x + 0.006\% \times \text{F.S.}$	
12	Alternating-direct current meter	DC Current	V.R. of Amperemeter Voltmeter Wattmeter and Ohmmeter JJG124	1mA~50A	$U_{\text{rel}}=0.02\%$	
				1mA~50A (45Hz~400Hz)	$U_{\text{rel}}=0.03\%$	
		AC Current		1mA~50A (400Hz~1000Hz)	$U=0.06\% \times V_x + 0.006\% \times \text{F.S.}$	
13	Alternating-direct Watt-hour	DC Watt-hour	V.R. of Amperemeter Voltmeter Wattmeter and Ohmmeter JJG124	75mV~750V, 1mA~50A	$U_{\text{rel}}=0.03\%$	
				75mW~37500W (45Hz~400Hz)	$U_{\text{rel}}=0.03\%$	
		AC Watt-hour		75mW~37500W (400Hz~1000Hz)	$U=0.06\% \times V_x + 0.006\% \times \text{F.S.}$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
14	Earth Resistance Meters	Earth Resistance	V.R. of Earth Resistance Meters JJG366	$(0.001 \sim 20111.11) \Omega$	$U_{rel}=(3 \sim 5) \times 10^{-5}$	
15	D.C. Bridges	resistance	V.R. of D.C. Bridges JJG125	$(10^{-3} \sim 10^{-1}) \Omega$	$U_{rel}=6 \times 10^{-5}$	
				$(10^{-1} \sim 10^4) \Omega$	$U_{rel}=4 \times 10^{-5}$	
				$(10^4 \sim 10^6) \Omega$	$U_{rel}=5 \times 10^{-5}$	
16	Withstand-ing Voltage Testers	ACI	V.R. of Withstanding Voltage Testers JJG795	$(0.5 \sim 100) \text{mA}$	$U_{rel}=0.7\%$	
		ACV		$(1 \sim 15) \text{kV}$	$U_{rel}=0.7\%$	
		DCI		$(0.5 \sim 100) \text{mA}$	$U_{rel}=0.7\%$	
		DCV		$(1 \sim 10) \text{kV}$	$U_{rel}=0.7\%$	
17	Verification Instrument for Electrocardiograph and Electroencephalograph	Voltage	V.R. of Verification Instrument for Electrocardiograph and Electroencephalograph JJG749	$10 \text{mV} \sim 5 \text{V}$	$U_{rel}=0.3\%$	
		Frequency		$(0.1 \sim 200) \text{Hz}$	$U_{rel}=0.3\%$	
		Cycle		$(0.01 \sim 10) \text{s}$	$U_{rel}=0.2\%$	
18	Standard cell	Voltage	V.R. of standard cell JJG153	1.0186V	$U=2 \mu \text{V}$	
19	High resistance box	resistance	V.R. of high voltage and high value D.C.resistor JJG1072	$100 \Omega \sim 10 \text{M} \Omega$	$U_{rel}=7 \times 10^{-4}$	
				$(10 \sim 100) \text{M} \Omega$	$U_{rel}=1 \times 10^{-3}$	
				$100 \text{M} \Omega \sim 1 \text{G} \Omega$	$U_{rel}=3 \times 10^{-3}$	
				$(1 \sim 10) \text{G} \Omega$	$U_{rel}=6 \times 10^{-3}$	
				$(10 \sim 1000) \text{G} \Omega$	$U_{rel}=1 \times 10^{-3}$	
20	*High insulation resistance meters	resistance	V.R. of High insulation resistance meters JJG690	$(10^3 \sim 10^6) \Omega$	$U_{rel}=8 \times 10^{-3}$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (<i>k</i> =2)	Note
				(10 ⁶ ~ 10 ⁹) Ω	<i>U</i> _{rel} =1×10 ⁻²	
				(10 ⁹ ~ 10 ¹⁰) Ω	<i>U</i> _{rel} =1.2× 10 ⁻²	
				(10 ¹⁰ ~ 10 ¹²) Ω	<i>U</i> _{rel} =5×10 ⁻²	
21	*Electronic insulating resistance meters(High resistance meter)	resistance	V.R. of Electronic insulating resistance meters JJG1005	(10 ³ ~ 10 ⁶) Ω	<i>U</i> _{rel} =3×10 ⁻²	
				(10 ⁶ ~ 10 ⁹) Ω	<i>U</i> _{rel} =2×10 ⁻²	
				(10 ⁹ ~ 10 ¹⁰) Ω	<i>U</i> _{rel} =4×10 ⁻²	
				(10 ¹⁰ ~ 2.5×10 ¹¹) Ω	<i>U</i> _{rel} =5×10 ⁻²	
22	*Megohmmeter	resistance	V.R. of Megohmmeter JJG622	(10 ³ ~ 10 ⁶) Ω	<i>U</i> _{rel} =4×10 ⁻²	
				(10 ⁶ ~ 10 ⁹) Ω	<i>U</i> _{rel} =3×10 ⁻²	
				10 ⁹ Ω ~ 10 ¹⁰ Ω	<i>U</i> _{rel} =4×10 ⁻²	
				(10 ¹⁰ ~ 2.5×10 ¹¹) Ω	<i>U</i> _{rel} =5×10 ⁻²	
23	Loop Resistance Tester and DC Resistance Meters	DC resistance	V.R. of Loop Resistance Tester and DC Resistance Meters JJG1052	0.001m Ω ~60 Ω	<i>U</i> _{rel} =1.4×10 ⁻³	
		AC resistance		1m Ω ~20m Ω (1A),0.1m Ω ~2m Ω (10A), 0.01m Ω ~0.2m Ω (100A), 0.001m Ω ~0.02m Ω (600A)	<i>U</i> _{rel} =6×10 ⁻³	
				10m Ω ~200m Ω (1A),1m Ω ~20m Ω (10A),0.1m Ω ~2m Ω (100A),0.01m Ω ~0.2m Ω (600A)	<i>U</i> _{rel} =3×10 ⁻³	



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No	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (k=2)	Note
				100mΩ ~ 51 Ω (1A),10mΩ ~ 5.1 Ω (10A),1mΩ ~ 510mΩ (100A),0.1mΩ ~ 60mΩ (600A)	$U_{rel}=2 \times 10^{-3}$	
24	Earth—Continuity Testers	DC resistance	V.R. of Earth—Continuity Testers JJG984	1mΩ ~ 11.11 Ω	$U_{rel}=9 \times 10^{-3}$	
				0.1mΩ ~ 1mΩ	$U_{rel}=3 \times 10^{-2}$	
				0.01mΩ ~ 0.1mΩ	$U_{rel}=6 \times 10^{-2}$	
		AC resistance		1mΩ ~ 11.11 Ω	$U_{rel}=9 \times 10^{-3}$	
				0.1mΩ ~ 1mΩ	$U_{rel}=5 \times 10^{-2}$	
				0.01mΩ ~ 0.1mΩ	$U_{rel}=1.1 \times 10^{-1}$	
时间和频率						
1	*The Telephone Charge Timer of Private Branch Exchange System	Time	V.R. of The Telephone Charge Timer of Private Branch Exchange System JJG(JI)26	(1~2000)s	$U=0.9s$	
2	Crystal Oscillators	Frequency	V.R. of Crystal Oscillators Inside the Electrical Measuring Instruments JJG180	1 MHz、5 MHz、10MHz	$U_{rel}=2 \times 10^{-10}$	
3	Stopwatches	Time(electronic stopwatches)	V.R. of Stopwatches JJG237	(1~86400)s	$U=0.02s$	
		Time(mechanical stopwatches)		(3~1800)s	$U=0.08s$	
电离辐射						
1	*Industrial X-Ray Apparatus	Air kerma rate	V.R. of X-Ray Flaw Detectors JJG40	5mGy/s~1Gy/min	$U_{rel}=10\%$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (<i>k</i> =2)	Note
2	*Medical Diagnostical X-ray Radiation Source for Computer Tomography(CT)	Dosage	V.R. of Medical Diagnostical X- Ray Radiation Source for Computer Tomography (CT) JJG1026	0.1mGy~1Gy	<i>U</i> _{rel} =8%	
		Spatial resolution		(0.4~2)mm	<i>U</i> =0.05mm	
		low contrast resolution		(2.5~7.5)mm	<i>U</i> =0.05mm	
3	*X-ray Security Inspection Equipment	Graphic resolution	C.S.For X-ray Security Inspection Equipment JJF1275	Cu:(0.2000~22.2)mm	<i>U</i> =0.04mm	
		Penetration		Steel: (4~38)mm	<i>U</i> =0.04mm	
		Material resolution		Al: (1~60) mm	<i>U</i> =0.04mm	
				Plastic: (1~5)mm, Organic glass: (80~120) mm	<i>U</i> =0.04mm	
				Steel: (0.2~14)mm	<i>U</i> =0.04mm	
		leakaga radiation		(0.1~500) mGy/h	<i>U</i> _{rel} =15%	
4	*Medical Electron Accelerator Radiation Source	absorbed dose	V.R. of Medical Electron Accelerator Radiation Source JJG589	(0.01~500)cGy	<i>U</i> _{rel} =3.5%	
5	*Medical Diagnostic X-ray Radiation Source	air kerma rate	V.R. of Medical Diagnostic X-ray Radiation Source JJG744	(0.01~1000) cGy/min	<i>U</i> _{rel} =7%	
		resolution		(0.6~5.0)Lp/mm	<i>U</i> =0.04Lp/mm	
		X-ray tube voltage		(40~150)kV	<i>U</i> _{rel} =5%	
6	*X-ray Radiation Sources for Medical Computed Radiography System and Digital Radiography System	air kerma	V.R. of X-ray Radiation Sources for Medical Computed Radiography System and Digital Radiography System JJG1078	(0.001~19.999)cGy	<i>U</i> _{rel} =7%	
		X-ray tube voltage		(40~150)kV	<i>U</i> _{rel} =5%	
		Spatial resolution		(0.6~5.0)Lp/mm	<i>U</i> =0.04Lp/mm	

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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (<i>k</i> =2)	Note
7	*Medical Diagnostic X-ray Radiation Sources for Medical Digital Subtraction Angiography	Air kerma rate	V.R. of Medical Diagnostic X-ray Radiation Sources for Medical Digital Subtraction Angiography JJG 1067	(001~1000) cGy/min	<i>U</i> _{rel} =7%	
		X-ray tube voltage		(40~150)kV	<i>U</i> _{rel} =5%	
		Spatial resolution		(0.6~5.0)Lp/mm	<i>U</i> =0.04Lp/mm	
光学						
1	Color Standard Plates	Reflectance Y	V.R. of Color Standard Plates JJG453	Reflectance Y	<i>U</i> =1.8	
		Chromaticity Coordinate x		Chromaticity Coordinate x: (0~1.000)	<i>U</i> =0.005	
		Chromaticity Coordinate y		Chromaticity Coordinate y: (0~1.000)	<i>U</i> =0.005	
2	Optical Filter	Wavelength Transmittance Absorbency	V.R. of Reference Filter for Calibration Spectrophotometer JJG1034	Absorption type: (190~1100)nm	<i>U</i> =0.3nm	
				Interference type: (360~700)nm	<i>U</i> =0.4nm	
		Wavelength Transmittance Absorbency		0.01~1.00	<i>U</i> _{rel} =0.5%	
		Wavelength Transmittance Absorbency		(0~3)	<i>U</i> =0.006	
3	Whiteness Meter	Blue Light Whiteness WB	V.R. of Whiteness Meters JJG512	Whiteness (0~100)	<i>U</i> =2.0	
4	Colorimeters and Color Difference Meters	Reflectance Y	V.R. for Colorimeters and Color Difference Meters JJG595	Reflectance Y: (0~100)	<i>U</i> =2.3	
		Chromaticity Coordinate x		Chromaticity Coordinate x: (0~1.000)	<i>U</i> =0.007	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
		Chromaticity Coordinate y		Chromaticity Coordinate y: (0~1.000)	$U=0.007$	
5	Illuminance Meter	Illuminance	V.R. of Illuminance Meter JJG245	(10~1000)lx	$U_{rel}=1.5\%$	
				(1000~3000)lx	$U_{rel}=1.0\%$	
6	Clarity Test Equipment	Illuminance	Calibration Specification for Clarity Test Equipment JJF1287	(10~1000)lx	$U_{rel}=3.5\%$	
				(1000~3000)lx	$U_{rel}=3.0\%$	
7	Abbe Refractometer	Index of refraction	V.R. of Abbe Refractometer JJG625	1.47~1.67	$U=8.4 \times 10^{-5}$	
		Index of refraction		0.007~0.021	$U=1.7 \times 10^{-4}$	
8	*Lovibond Comparable Colorimeter	Lovibond Unit	V.R. of Lovibond Comparable Colorimeter JJG758	R: (0.1~5.6) Lovibond Unit	0.8 Lovibond Unit	
9	Ultraviolet Irradiance Meters	ultraviolet irradiancy	V.R. of Ultraviolet Irradiance Meters JJG879	(10~1500) μ W/cm	$U_{rel}=15\%$	
化学						
1	Hygrometer (Hygrograph)	Humidity	V.R. of Meteorological Thermohygrometers JJG205, C.S. of Humidity Sensors JJF1076	RH: (30~95) % (Mechanical)	$U=1.4\%$	
		Humidity		RH: (10~95) % (Humidity Sensors)	$U=1.4\%$	
2	*Gas Chromatograph	sensitivity	V.R. of Gas Chromatograph JJG700	TCD ≥ 800 mV•mL/mg	$U_{rel}=10\%$	
				FID $\leq 5 \times 10^{-10}$ g/s	$U_{rel}=8\%$	
				FPD $\leq 5 \times 10^{-10}$ g/s(S)	$U_{rel}=8\%$	
				FPD $\leq 1 \times 10^{-10}$ g/s(P)	$U_{rel}=8\%$	
				NPD $\leq 5 \times 10^{-12}$ g/s(N)	$U_{rel}=8\%$	
		detectability				

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				NPD ≤1×10 ⁻¹¹ g/s(P)	U _{rel} =8%	
				ECD ≤5×10 ⁻¹² g/mL	U _{rel} =10%	
3	*Liquid Chromatograph	detectability	V.R. of Liquid Chromatographs JJG705	UV Detector/Diode-array Detector ≤5×10 ⁻⁸ g/mL(naphthyl-methanol)	U _{rel} =5%	
				RID Detector ≤5×10 ⁻⁶ g/mL(cholesterol/methanol)	U _{rel} =6%	
				ESLD≤ 5×10 ⁻⁶ g/mL(cholesterol/methanol)	U _{rel} =6%	
				luorescence Detector ≤5×10 ⁻⁶ g/mL(naphthyl-methanol)	U _{rel} =5%	
4	*Visible Range Spectrophotometer	Wavelength Scale of Transmission	V.R. of Ultraviolet,visible,Near-Infrared Spectrophotometers JJG178	(360~900)nm	U=1.0nm	
		Scale of Transmission		(0~100)%	U=0.5%	
5	*Atomic Absorption Spectrophotometer	detectability	V.R. of Atomic Absorption Spectrophotometer JJG694	Copper:≤0.02 μ g/mL	U=0.008 μ g/mL	
				Cadmium≤4pg	U=1.0pg	
6	*Ultraviolet Visible Range Spectrophotometer in Single Beam	Wavelength	V.R. of Ultraviolet,visible,Near-Infrared Spectrophotometers JJG178	(190~340)nm	U=0.5nm	
		Scale of Transmission		(340~900)nm	U=0.6nm	
				(0~100)%	U=0.5%	
7	*Ultraviolet Visible Range Spectrophotometer in	Wavelength	V.R. of Ultraviolet,visible,Near-Infrared Spectrophotometers JJG178	(190~340)nm	U=0.5nm	
				(340~900)nm	U=0.6nm	



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	Double Beam	Scale of Transmission		(0~100)%	$U=0.5\%$	
8	Samplers for Stack Dast	Flow	V.R. of Samplers for Stack Dust JJG680	(0.1~60) L/min	$U_{rel}=2.0\%$	
9	*Auto Polarimeter	Optical rotation	V.R. of Polarimeter and Polarimetric Saccharimeter JJG536	(-90~+90)°	$U=0.004^\circ$	
10	Hand Sacchari-meter	Sugar Content	V.R. of Hand Saccharimeter (Content-meter) and Hand Refractometer JJG820	(1~80)%	$U_{rel}=2\%$	
11	Hand Refractometer	Refractive index	V.R. of Hand Saccharimeter (Content-meter) and Hand Refractometer JJG820	1.3330~1.5200	$U=0.0030$	
12	Dust Samplers	Flow	V.R. of Dust Samplers JJG520	(0.1~40) L/min	$U_{rel}=2.0\%$	
13	*Dispersive Infrared Spectrophotometers	Wave Number	V.R. of Dispersive Infrared Spectrophotometers JJG681	(900~2000)cm ⁻¹	$U=0.9\text{ cm}^{-1}$	
				(2000~4000)cm ⁻¹	$U=1.7\text{ cm}^{-1}$	
14	Air Sampler	Flow	Verification Regulation for Air Sampler JJG956	(100~2000) mL/min	$U_{rel}=1.5\%$	Except for Type of constant temperature and flow
15	*Ion Chromatograph	detectability	V.R. of Ion Chromatograph JJG823	conductivity detector(Cl-)≤0.02 μg/ml	$U=0.0011\text{ μg/ml}$	
				(conductivity detectorLi+)≤0.02 μg/ml	$U=0.001\text{ μg/ml}$	
				UV-detector(NO2-)≤0.02 μg/ml	$U=0.001\text{ μg/ml}$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
16	*Gas Chromatography and mass spectrum metry	SNR	C.S. for Bench Top Gas Chromatography-Mass Spectrometers JJF1164	EI: >10	$U_{rel}=5.3\%$	
				plus CI: >10	$U_{rel}=5.4\%$	
				minus CI: >100	$U_{rel}=5.5\%$	
17	*Folium Scanner	Wavelength	C.S. of Thin layer chromatography scanners JJF (Ji) 12	(330~670) nm	$U=1.0\text{nm}$	
18	*ICP Spectrometer	Detectability	V.R. of Emission Spectrometer JJG768	$\text{Zn} \leq 0.01\text{mg/L}$	$U=0.0008\text{mg/L}$	
				$\text{Ni} \leq 0.03\text{mg/L}$	$U=0.0032\text{ mg/L}$	
				$\text{Mn} \leq 0.005\text{mg/L}$	$U=0.0033\text{ mg/L}$	
				$\text{Cr} \leq 0.02\text{mg/L}$	$U=0.0040\text{ mg/L}$	
				$\text{Cu} \leq 0.02\text{mg/L}$	$U=0.0018\text{ mg/L}$	
				$\text{Ba} \leq 0.005\text{mg/L}$	$U=0.0003\text{ mg/L}$	
19	*Direct-reading Spectrometer	Detectability	V.R. of Emission Spectrometer JJG768	$\text{C} \leq 0.02\%$	$U=0.0008\%$	
				$\text{Si} \leq 0.02\%$	$U=0.0021\%$	
				$\text{Cr} \leq 0.01\%$	$U=0.00037\%$	
				$\text{Mn} \leq 0.02\%$	$U=0.00043\%$	
				$\text{Ni} \leq 0.02\%$	$U=0.0047\%$	
				$\text{V} \leq 0.02\%$	$U=0.0021\%$	
20	*Turbidimeter	Turbidity	V.R. of Turbidimeter JJG880	(0.01~400)NTU	$U_{rel}=3.0\%$	
21	*conductivity meter	conductivity	V.R. of Electrolytic Conductivity Meters JJG376	(0.05~1×10 ⁵) μ S/cm	$U_{rel}=0.2\%$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
22	*pH Meter	pH Value	V.R. of Laboratory pH Meters JJG119	Electric meter: (0~14) pH Supporting: (0~14) pH	$U=0.0008\text{pH}$ $U=0.01\text{pH}$	
23	*Potentiometric Titrators	Voltage	V.R. of Automatic Potentiometric Titrators JJG814	(-2000~2000)mV	$U=0.2\text{mV}$	
24	*Carbon Monoxide and Carbon Dioxide Infrared Gas Analyzer	Concentration	V.R. of Carbon Monoxide and Carbon Dioxide Infrared Gas Analyzer JJG635	CO: $(1\sim900)\times10^{-6}\text{mol/mol}$ CO: $(0.1\sim1)\%$ CO ₂ : $(0.1\sim75)\%$	$U_{\text{rel}}=1.1\%$ $U_{\text{rel}}=1.1\%$ $U_{\text{rel}}=2.1\%$	
25	*Sulfur Dioxide Gas Detectors	Concentration	V.R. of Sulfur Dioxide Gas Detectors JJG551	$(1\sim900)\times10^{-6}\text{mol/mol}$ $(0.1\sim5)\%$	$U_{\text{rel}}=2.5\%$ $U_{\text{rel}}=2.5\%$	
26	*Sulfur Hydrogen Gas Detectors	Concentration	V.R. of Sulfur Hydrogen Gas Detectors JJG695	$(1\sim1000)\times10^{-6}\text{mol/mol}$	$U_{\text{rel}}=3.0\%$	
27	*Cold-Atom absorb Mercury Analyzers	Concentration	V.R. of Mercury Analyzers JJG548	Atomic absorption(0.1~200)ng Atomic fluorescen(0.1~50)ng	$U_{\text{rel}}=3.6\%$ $U_{\text{rel}}=5.0\%$	
28	*Vehicle Exhaust Emission Measuring Instruments	Concentration	V.R. of Vehicle Exhaust Emission Measuring Instruments JJG688	CO: $(0.01\sim14.00)\times10^{-2}$ NO: $(1\sim8000)\times10^{-6}\text{mol/mol}$ CO ₂ : $(0.1\sim18.0)\times10^{-2}$ O ₂ : $(0.02\sim25.0)\times10^{-2}$ C ₃ H ₈ : $(1\sim9999)\times10^{-6}$	$U_{\text{rel}}=3.6\%$ $U_{\text{rel}}=3.6\%$ $U_{\text{rel}}=3.7\%$ $U_{\text{rel}}=3.2\%$ $U_{\text{rel}}=3.7\%$	
29	*Oil Concentration in Water Analyzer	Concentration	V.R. of Oil Concentration in Water Analyzer JJG950	$(5\sim40)\text{mg/L}$	$U_{\text{rel}}=3.1\%$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (<i>k</i> =2)	Note
30	*Disintegration Analyzers	Temperature	C.S. of Disintegration Analyzers JJF1449	(30~50)℃	<i>U</i> =0.6℃	
		Time		(1~500)s	<i>U</i> _{rel} =0.8%	
		Length		(0~100)mm	<i>U</i> =0.6mm	
31	Dissolution Meter	Temperature	Calibration Specification of Dissolution Testers JJF (Ji) 08	(15~45)℃	<i>U</i> =0.6℃	
		Quality		(0~100)r/min	<i>U</i> =0.9 r/min	
32	*Ionometers	Ion Concentration	V.R.of Ionometers JJG757	(0~14)pX	<i>U</i> =0.01 pX	
33	*Determinators for Total Sulfur in Coal	Concentration	V.R.of Determinators for Total Sulfur in Coal JJG1006	(0.01~1.00)%	<i>U</i> _{rel} =8.6%	
				(1.00~6.00)%	<i>U</i> _{rel} =2.7%	
34	*Alarmer Detectors of Combustible Gas	Concentration	V.R. of Alarmer Detectors of Combustible Gas JJG693	(1~100)%LEL	<i>U</i> _{rel} =1.6%	
35	Dissolved Qxygen Meter with Covered-Membrane-Electrode	Concentration	V.R.of Dissolved Qxygen Meter with Covered-Membrane-Electrode JJG291	(0~20)mg/L	<i>U</i> =0.14 mg/L	
36	*Continuous Emission MonitoringSystems of Flue Gas Emitted	the concentration of particulate	C.S. for Continuous Emission MonitoringSystems of Flue Gas Emitted from stationary source JJF1585	(0~ 50)mg/m ³	<i>U</i> =1.1mg/m ³	
				(50~ 2500)mg/m ³	<i>U</i> _{rel} =3%	
		the concentration		SO ₂ : (0~250) μ mol/mol	<i>U</i> =2.1 μ mol/mol	
				NO: (0~250) μ mol/mol	<i>U</i> =2.1 μ mol/mol	
				O ₂ : (0.01~25)%	<i>U</i> _{rel} =6%	
		flow rate		(1~30)m/s	<i>U</i> _{rel} =3%	
		temperature		(10~400)℃	<i>U</i> =0.6℃	



№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
		Humidity	ilac-MRA	(10~95)%	$U_{rel}=6\%$	
		pressure		(-2~2)kPa	$U=0.010\text{kPa}$	
37	Bomb Calorimeter	Caloricity	Verification Regulation of The Bomb Calorimeter JJG672	(0.1~26500)J/g	$U_{rel}=0.2\%$	
38	Melting Point Meter	Temperature	V.R. of Melting-Point-Measuring Instruments JJG701	(0~ 200)°C	$U=0.16^{\circ}\text{C}$	
				(200~300)°C	$U=0.18^{\circ}\text{C}$	
39	*Zone of inhibition measurement instrument	Length	C.S. of Zone of Inhibition Measurement Instrument JJF (Ji) 36	(0.001~25.000)mm	$U=0.036\text{ mm}$	
40	*Morie Osmolarity Determinator	Molar Concentration	V.R. of Morie Osmolarity Determinator JJG1089	(100~300)mOsmol/kg	$U=1.8\text{ mOsmol/kg}$	
				(400~700)mOsmol/kg	$U_{rel}=0.6\%$	
41	Working Capillary Viscometer	kinematic viscosity	V.R. of Working Capillary Viscometer JJG155	(2~100000) mm ² /s	$U_{rel}=0.3\%$	
42	Rotational Viscometers	dynamic viscosity	V.R. of Rotational Viscometers JJG1002	(2~50) mPa · s	$U_{rel}=1.0\%$	
				(100~10000) mPa · s	$U_{rel}=1.1\%$	
43	*Fourier Transform Infrared Spectrometers	Wave Number	C.S. for Fourier Transform Infrared Spectrometers JJF1319	(900~4000)cm ⁻¹	$U=0.60\text{cm}^{-1}$	
44	*Electrolyte Analyzers	Concentration	V.R. for Electrolyte Analyzers JJG1051	K ⁺ : (1.50~7.50)mmol/L	$U_{rel}=2.6\%$	
				Na ⁺ : (100.0~180.0)mmol/L	$U_{rel}=2.2\%$	
				Cl ⁻ : (80~160)mmol/L	$U_{rel}=2.0\%$	
45	*Friability Tester	rotate speed	C.S. of Friability Tester JJF (Ji) 51	(0~25)r/min	$U=1\text{r/min}$	
46	*Liquid Chromatography-	SNR	C.S. for Liquid Chromatography-Mass Spectrometers JJF1317	triple quadrupole mass spectrometerESI+: ≥ 30	$U_{rel}=9.8\%$	

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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
	Mass Spectrometer		ilac-MRA CHINA NATIONAL ACCREDITATION SERVICE FOR CONFORMITY ASSESSMENT SCHEDULE OF ACCREDITED CALIBRATION METHODS	triple quadrupole mass spectrometerESI-: ≥ 10	$U_{\text{rel}}=9.8\%$	
				triple quadrupole mass spectrometerAPCI+: ≥ 30	$U_{\text{rel}}=9.8\%$	
				Single Quad Mass SpectrometerESI+: ≥ 10	$U_{\text{rel}}=9.8\%$	
				Single Quad Mass SpectrometerESI-: ≥ 10	$U_{\text{rel}}=9.8\%$	
				Single Quad Mass SpectrometerAPCI+: ≥ 10	$U_{\text{rel}}=9.8\%$	
				ion trap mass spectrometryESI+: ≥ 10	$U_{\text{rel}}=9.8\%$	
				ion trap mass spectrometryESI-: ≥ 10	$U_{\text{rel}}=9.8\%$	
				ion trap mass spectrometryAPCI+: ≥ 10	$U_{\text{rel}}=9.8\%$	
47	*the Differential Scanning Calorimeter	Temperature	V.R. of the Differential Scanning Calorimeters JJG936	(156~575)°C	$U=0.98^\circ\text{C}$	
		Caloricity		(0~120)J/g	$U=1.32\text{J/g}$	
48	*Oxygen Detecors	Concentration	C.S. for Oxygen Detecors JJF(Ji)65	(0.01~30)%	$U_{\text{rel}}=1.7\%$	
49	*Carbon Dioxide Detecors	Concentration	C.S. For Carbon Dioxide Detecors JJF(Ji)66	(0.1~75)%	$U_{\text{rel}}=1.1\%$	
50	*Particulate Analyzer	Concentration	C.S. For Particulate Analyzer JJF1290	(1~3500) particle/mL	$U_{\text{rel}}=5.2\%$	
51	*Carbon-Sulfur Analyzer	Concentration	V.R. of Carbon-Sulfur Analyzer JJG395	C: (0.100~1.000)%	$U=0.008\%$	
				C: (1.00~3.00)%	$U=0.02\%$	
				S:(0.010~0.100) %	$U=0.002\%$	



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No	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
52	*Total Suspended Particulates Sampler	Flow	V.R. of Total Suspended Particulates Sampler JJG943	(80~1200) L/min	$U_{rel}=1.2\%$	
53	*Formaldehyde Measurement instrument	Wavelength	V.R. of Formaldehyde Measurement instrument JJG(Ji) 31	(200~1100)nm	$U=0.7$ nm	
		Concentration		(0~10.0) mg/mL	$U_{rel}=3.5\%$	
54	*Silicate Analyzer	Concentration	C.S. for Silicate Analyzers JJF 1539	(0~100)μg/L	$U=2.3$ μg/L	
				(100~1000)μg/L	$U=3.3$ μg/L	
55	*Phosphate Analyzer	Concentration	C.S. for Phosphate Analyzer JJF (Ji) 63	(0.1~1000) mg/L	$U_{rel}=0.9\%$	
56	Precision Dew-point Hygrometer	Dew-point Hygrometer	V.R. of the Precision Dew-point Hygrometers JJG499	Dew-point Hygrometer: (-70~40)°C	$U=0.42$ °C	
57	Airborne Particle Counter	Concentration	C.S. for Airborne Particle Counter JJF 1190	(0~400000)per28.3L	$U_{rel}=11\%$	
58	*Chemical Oxygen Demand(COD)Meters	Concentration	V.R. of Chemical Oxygen Demand (COD) Meters JJG975	(0.1~1000)mg/L	$U_{rel}=3.0\%$	
		Concentration		(100~200)°C	$U_{rel}=0.4$ °C	
59	*Flue Gas Analyzers	Concentration	V.R. of Flue Gas Analyzers JJG968	CO: (1~900)×10 ⁻⁶ mol/mol	$U_{rel}=2.2\%$	
				NO: (1~1000) ×10 ⁻⁶ mol/mol	$U_{rel}=2.25$	
				SO ₂ : (1~900) ×10 ⁻⁶ mol/mol	$U_{rel}=2.5\%$	
				O ₂ : (0.01~30)%	$U_{rel}=1.4\%$	
60	*Total Organic Carbon Analyzer	Concentration	V.R. of Total Organic Carbon Analyzer JJG821	(0.01~1000)mg/L	$U_{rel}=2.4\%$	
61	*Atomic Fluorescence Spectrophotometer	Detection limit	V.R. of Atomic Fluorescence Spectrophotometers JJG939	As≤0.4ng	$U=0.02$ ng	
				Sb≤0.4ng	$U=0.04$ ng	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
62	Formaldehyde Gas Detector	Concentration	V.R. of Formaldehyde Gas Analyzers JJG1022	$(0.01 \sim 2.0) \mu \text{mol/mol}$	$U_{\text{rel}}=3.2\%$	
63	*Quadrupole Inductively Coupled Plasma Mass Spectrometer	Detection limit	C.S. for Quadrupole Inductively Coupled Plasma Mass Spectrometers JJF1159	$\text{In} \leq 10 \text{ng/L}$	$U=0.08 \text{ng/L}$	
				$\text{Bi} \leq 10 \text{ng/L}$	$U=0.06 \text{ng/L}$	
				$\text{Be} \leq 30 \text{ng/L}$	$U=1.0 \text{ng/L}$	
64	*Instrument for KF Coulometry Titration	mass	V.R. of Instrument for KF Coulometry Titration JJG1044	$(10 \sim 5000) \mu \text{g}$	$U_{\text{rel}}=1.3\%$	
65	Verifying Meter for pH Meters	Voltage	V.R. of Verifying Meter for pH Meters JJG919	$(10 \sim 2000) \text{mV}$	$U_{\text{rel}}=1 \times 10^{-4}$	
专用						
1	*Ceinical Chemistry Analyzer	Absorbency	V.R. of Ceinical Chemistry Analyzer JJG464	Absorbency: $0.5 \sim 1.0$	$U=0.01$	
2	Pulmonary Function Measuring Instrument	Vital Capacity	C.S. for the Pulmonary Function Measuring Instrument JJF1213	$(2 \sim 10) \text{L}$	$U_{\text{rel}}=1.0\%$	
		forced vital capacity		$(2 \sim 10) \text{L}$	$U_{\text{rel}}=1.0\%$	
		peak expiratory flow		$(4 \sim 14) \text{L/s}$	$U_{\text{rel}}=3\%$	
		maximal voluntary ventilation		$(0.5 \sim 250) \text{L/min}$	$U_{\text{rel}}=3\%$	
		gas analyzer		$20\% \sim 80\%$	$U_{\text{rel}}=1.2\%$	
3	*Electrosurgical Generator	high-frequency current	C.S. for Electorsurgical Generator JJF1217	$(0.001 \sim 0.5) \text{A}$	$U_{\text{rel}}=6\%$	
		output power		$(1 \sim 300) \text{W}$	$U_{\text{rel}}=6\%$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
		maximal output power	ilac-MRA	(1~300)W	$U_{rel}=6\%$	
		enclosure leakage current		(1~1000) μ A	$U_{rel}=3\%$	
4	*Lung Ventilators	tidal volume	C.S.for Lung Ventilators JJF1234	(50~1000)m L/min	$U_{rel}=5\%$	
		Frequency		(1~1000) bpm	$U_{rel}=3\%$	
		inspiration pressure		(1.0~3.0) kPa	$U_{rel}=4\%$	
		PEEP		(1.0~2.0)kPa	$U_{rel}=5\%$	
		inspiratory flow oxygen concentration		(21~100)%	$U=1.5\%$	
		Temperature rise		(0~40)°C	$U=0.3^{\circ}\text{C}$	
5	*Cardiac Defibrillators	delivered energy	C.S.for Cardiac Defibrillators JJF1149	(2~100)J	$U=2.5$ J	
				(100~360)J	$U=6\%$	
		transcutaneous pacing pulse rate		(30~100)times/min	$U=1.3\text{times/min}$	
				(100~220)times/min	$U_{rel}=1.2\%$	
		Heart rate		(30~300)times/min	$U_{rel}=1.2\%$	
6	*Hemodialysis Equipment	dialysate conductivity	C.S.for Hemodialysis Equipment JJF1353	(12.5~15.5)mS/cm	$U_{rel}=2.0\%$	
		dialysate temperature		(25~100)°C	$U=0.20^{\circ}\text{C}$	
		vein(artery) pressure		(-40~60)kPa	$U=0.4\text{kPa}$	



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№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
		dialysate flow	ilac-MRA C.S. of Electromagnetic Radiation Source for Medical Magnetic Resonance Imaging JJF(Ji)48	(250~750) mL/min	$U_{rel}=2.0\%$	
		dialysate pH		(0~14)pH	$U=0.03\text{pH}$	
7	*Medical Magnetic Resonance Imaging	Spatial resolution	C.S. of Electromagnetic Radiation Source for Medical Magnetic Resonance Imaging JJF(Ji)48	(1~11)Lp/cm	$U=0.04\text{Lp/cm}$	
		Intensity of Magnetic Field		(0.2~3)T	$U_{rel}=3\%$	
8	*Baby Incubator	temperature	C.S. for Baby Incubator JJF1260	(28.0~36.0)°C	$U=0.3^\circ\text{C}$	
		relative humidity		(30~100)%	$U=3.5\%$	
		noise		(30~100)dB	$U=3.5\text{dB}$	
9	*ELISA Analytical Instruments	Wavelength	V.R. of ELISA Analytical Instruments JJG861	0.2~1.5	$U=0.02$	
		Absorbency		(410~780)nm	$U=1.3\text{nm}$	
10	*Blood Cell Analyzer	Concentration of blood cells	V.R. of Blood Cell Analyzers JJG714	RBC: $(3\sim5)\times 10^{12}/\text{L}$	$U_{rel}=3.4\%$	
				WBC: $(4\sim8)\times 10^9/\text{L}$	$U_{rel}=3.4\%$	
				HGB: $(60\sim160)\text{g}/\text{L}$	$U_{rel}=3.4\%$	
				PLT: $(100\sim300)\times 10^9/\text{L}$	$U_{rel}=3.4\%$	
11	*Urine Analyzers	pH	C.S. of Urine Analyzers JJF1129	(4.0~9.0)pH	$U_{rel}=7.9\%$	
无线电						
1	Alternating Current Bridge	Inductance	V.R. of Alternating Current Bridge JJG441	1H,10mH,100 μH	$U_{rel}=8\times 10^{-4}$	only for 1kHz
				100mH	$U_{rel}=6\times 10^{-4}$	




№	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty (<i>k</i> =2)	Note
		Capacitance	ilac-MRA CHINA NATIONAL ACCREDITATION SERVICE FOR CONFORMITY ASSESSMENT SCHEDULE OF ACCREDITATION CERTIFICATE	1mH	$U_{rel}=9\times 10^{-4}$	
				1 μ F	$U_{rel}=3\times 10^{-4}$	
				100nF,10nF	$U_{rel}=4\times 10^{-4}$	
				1nF,100pF	$U_{rel}=5\times 10^{-4}$	
		Resistance		(0.1~1000) Ω	$U_{rel}=(7\sim 8)\times 10^{-4}$	
2	Electronic Voltmeter	AC Voltage	V.R. of Electronic Voltmeter JJG250	(10~100)mV ,(0.1~1)V (1~10)V	$U_{rel}=1.2\%$	only for 20Hz~ 500MHz
		AC Voltage		(10~30)mV ,(10~300)mV, (0.1~3)V, (1~30)V	$U_{rel}=1.9\%$	
3	C.S. of Digital Storage Oscilloscope	Time	C.S. of Digital Storage Oscilloscope JJF1057	1ns~50s	$U_{rel}=0.1\%$	1M Ω input impedanc e for DC voltage and square wave voltage calibratio n
		DC Voltage		1mV	$U_{rel}=3\%$	
				2mV	$U_{rel}=1.5\%$	
				5mV	$U_{rel}=0.7\%$	
				10mV	$U_{rel}=0.5\%$	
				20mV	$U_{rel}=0.4\%$	
				50mV~200V	$U_{rel}=0.3\%$	
		Square Wave Voltage		10mV~200V	$U_{rel}=0.6\%$	
		Band Width		≤3.2GHz	$U_{rel}=4.7\%$	
		Rise time		≥450ps	$U_{rel}=6.3\%$	
4	Analogue Oscilloscope	Time	V.R. of Analogue Oscilloscope JJG262	1ns~5s	$U_{rel}=0.2\%$	



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No	Instrument	Parameter	Calibration Method	Range	Expanded Uncertainty ($k=2$)	Note
		Voltage	 CHINA NATIONAL ACCREDITATION SERVICE FOR CONFORMITY ASSESSMENT SCHEDULE OF ACCREDITATION CERTIFICATE	1mV~2mV	$U_{rel}=0.9\%$	
				5mV~10mV	$U_{rel}=0.7\%$	
				20mV~220V	$U_{rel}=0.6\%$	
		Band Width		$\leq 3.2\text{GHz}$	$U_{rel}=4.7\%$	
		Rise time		$\geq 450\text{ps}$	$U_{rel}=6.3\%$	



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