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SCHEDULE 5 ACCREDITED CALIBRATION AND MEASUREMENT CAPABILITY SCOPE

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

№	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
1.Mechanics							
1	*Digital Indicating Weighing Instrument	mass	V.R.of Digital Indicating Weighing Instruments JJG539	4g～60kg	U=（0.03~2）g		
				60kg～1t	U=2g~0.06kg		
				(1～10)t	U=(0.06~1.0)kg		
				(10～100)t	U=（1.0~6）kg		
2	*Non-self Indicating Weight	mass	V.R.of Non-self indication Weighing Instruments JJG14	(1～10)kg	U=(0.4~1.5)g		
				(10～100)kg	U=(1.5~15)g		
				100kg～1t	U=15g~0.15kg		
3	*Analogue Indicating Weighing Instrument	mass	V.R.of Analogue Indicating Weighing Instruments JJG13	(0.25～8)kg	U=(1~4)g		
				(8～50)kg	U=(4~10)g		

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The scope of the accreditation in Chinese remains the definitive version.

№	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
4	*Rockwell hardness Testers	Hardness	V.R.of Metallic Rockwell Hardness Testers(Scales A,B,C,D,E,F,G,H,K,N,T) JJG112	(20～70)HRC	U=0.5HRC		
				(85～100)HRBW	U=0.7HRBW		
				(80～88)HRA	U=0.5HRA		
5	*Brinell Hardness Testers	Hardness	V.R.of Metallic Brinell Hardness Testers JJG150	(75～125)HBW	U_{rel}=2.5%		
				(125～600)HBW	U_{rel}=1.9%		
6	*Vickers Hardness Testers	Hardness	V.R.of Metallic Vickers Hardness Testing Machines JJG151	（170～225）HV5	U_{rel}=5.2%		
				（>225～1000）HV5	U_{rel}=3.3%		
				（>225～1000）HV10	U_{rel}=3.3%		
				（>225～1000）HV30	U_{rel}=3.3%		
7	pencil hardness tester	pencil-tip load	Calibration Specification for Pencil Hardness Testers JJF（SH）007	（500～1000）g	U=1.6g		
		angle		44° ～46°	U=0.24°		
8	*Universal Tension and Compressi on Testing Machine	Force	V.R.of Tension, Compression and Universal Testing Machines JJG139	0.1N～5MN	U_{rel}=0.44%		
9	Working Dynamo-meters	Force Indication	V.R.of Working Dynamometers JJG455	(0.01～500)N	U_{rel}=0.22%		
				500N～300kN	U_{rel}=0.44%		
10	Hydraulic Jack	Force Indication	V.R.of Hydraulic Jacks JJG621	(10～5000）kN	U_{rel}=0.53%		
11	Torque Wrenches	Torque	V.R.of Torque Wrenches JJG707	（2～50）Nm	U_{rel}=1.4%		
				（50～3000）Nm	U_{rel}=1.1%		

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№	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
12	*Calibration Instrument for Torque Wrenches	Torque	V.R.of Calibration Instrument for Torque Wrenches JJG797	（0.1～1000）Nm	U_{rel}=0.15%		
13	Techometer	Rate	V.R.of Techometers JJG105	（20～1000）r/min	U_{rel}=0.3%		
				（1000～40000）r/min	U_{rel}=0.12%		
14	Locomotive Pipette	capacity	V.R.of Locomotive Pipette JJG646	(1～10）μL	U_{rel}=0.6%		
				(10～10000） μL	U_{rel}=0.1%		
15	Electromagnetic Flowmeters	Flow	V.R. of Electromagnetic Flowmeters JJG1033	medium：water DN：(15～200）mm （0.1～700）m^3/h	U_{rel}=0.06%		
16	Ultrasonic Flowmeters	Flow	V.R. of Ultrasonic Flowmeters JJG 1030	medium：water DN：(15～200）mm （0.1～700）m^3/h	U_{rel}=0.07%		
17	Vortex-shedding Flowmeter	Flow	V.R. of Vortex-shedding Flowmeter JJG 1029	（medium：water DN：(15～200）mm （0.1～700）m^3/h	U_{rel}=0.1%		
18	Turbine Flowmeter	Flow	V.R.of Turbine Flowmeter JJG1037	medium：water DN：(15～200）mm （0.1～700）m^3/h	U_{rel}=0.07%		
2.Chemistry							
1	*Spectrophotometer （UV-VIS）	Wavelengh	V. R. of Ultraviolet 、Visible、Near-Infrared Spectrophotometers JJG178 JJG178	(190～340)nm	U=0.5nm		
				(340～900)nm	U=0.6nm		
		Photometric		A:0% τ ～100% τ	U=0.4%		
				B:0% τ ～100% τ	U=0.6%		

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2	Laboratory pH Meters	pH	V. R. of Laboratory pH Meters JJG119	Meter:0～14	U=0.01		
				Instrument:3～10	U=0.02		
3	Polarimeter and Polarimetric Saccharimeters	Polarimeter	V. R. of Polarimeter and Polarimetric Saccharimeters JJG536	-45° ～ +45°	U=0.005°		
		Polarimetric Sacchari		(-20～+105)° Z	U=0.01° Z		
4	Electrolytic Conductivity Meters	Conductivity	V. R. of Electrolytic Conductivity Meters JJG376	Electronic unit:(0.1～1×10^5) μS/cm	U_{rel}=0.3%		
				Instrument:(2～2000 μS/cm	U_{rel}=0.4%		
5	Ionmeter	mV	V. R. of Ionometer JJG757	(0～2000)mV	U=0.7mV		
		pX		Meter:0～14	U=0.01		
				Instrument:3～8	U=0.02		
6	*Gas Chromatograph	Detection limit	V. R. of Gas Chromatograph JJG700	FID:≤0.5ng/s	U_{rel}=4%		
				ECD:≤5pg/mL	U_{rel}=5%		
				FPD:S≤0.5ng/s	U_{rel}=5%		
				FPD:P≤0.1ng/s	U_{rel}=5%		
				NPD:N≤5pg/s	U_{rel}=5%		
				NPD:P≤10pg/s	U_{rel}=5%		
		Sensitivity		TCD:≥ 800mV • ml/mg	U_{rel}=5%		
7	*Liquid chromatograph	Minimum detected concentration	V. R. of Liquid chromatographs JJG705	UVD:≤5× 10^{-8}g/mL	U_{rel}=8%		
				DAD:≤5×10^{-8}g/mL	U_{rel}=8%		

№	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
				FAD:≤5×10^{-9}g/mL	U_{rel}=8%		
				RID:≤5×10^{-6}g/mL	U_{rel}=9%		
				ELSD:≤5×10^{-6}g/mL	U_{rel}=9%		
8	*Atomic Absorption Spectrophotometer	Limited calculation	V. R. of Atomic Absorption Spectrophotometer JJG694	flame:≤0.02 μ g/mL	U=0.005 μ g/mL		
				graphite furnace:≤4pg	U=0.4pg		
9	*Ion Chromatograph	Minimum detecting limited concentration	V. R. of Ion Chromatographs JJG823	ECD: ≤0.02mg/L	U_{rel}=13%		
				UVD: ≤0.02mg/L	U_{rel}=13%		
				ED: ≤0.02mg/L	U_{rel}=13%		
10	*Mercury Analyzers	Detection limit	V. R. of Mercury Analyzers JJG548	≤0.1ng	U_{rel}=10%		
11	Carbon Dioxide Infrared Gas Analyzers	Concentration	V. R. of Carbon Monoxide and Carbon Dioxide Infrared Gas Analyzers JJG635	CO:(1～2000) μmol/mol	U_{rel}=3%		
				CO_2:(1～25000) μmol/mol	U_{rel}=2%		
12	Formaldehyde Gas Analyzer	Concentration	V. R. of Formaldehyde Gas Analyzers JJG1022	(0.02～1.5)μmol/mol	U_{rel}=4%		
13	*Liquid Chromatography-Mass Spectrometer	S/N ratio	C. S. for Liquid Chromatography-Mass Spectrometers JJF1317	≥10:1	U_{rel}=9%		
14	Dissolved Oxygen Meter	Concentration	V. R. of Dissolved Oxygen Meters JJG291	(1～20)mg /L	U=0.05mg /L		
15	*Gas Chromatography-Mass Spectrometers	S/N ratio	C. S. for Gas Chromatography-Mass Spectrometries JJF1164	≥10:1	U_{rel}=15%		
16	*Alarmer Detector	Concentration	V. R. of Alarmer Detector of	CH_4:(1～100)%LEL	U_{rel}=3%		

№	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
	of Combusti ble Gas		Combustible Gas JJG693	C_3H_8:(1～100)%LEL	U_{rel}=3%		
				C_4H_{10}:(1～100)%LEL	U_{rel}=3%		
17	*Carbon Monoxide Detector	Concentration	V. R. of Carbon Monoxide Detectors JJG915	(1～2000) ×10^{-6}mol/mol	U_{rel}=4%		
18	*Sulfur Hydrogen Gas Detectors	Concentration	V. R. of Sufur Hydrogen Gas Detectors JJG695	(1～200)×10^{-6}mol/mol	U_{rel}=4%		
19	*Oxygen Analyzer and Oxygen Detector	Concentration	V. R. of Electrochemical Oxygen Meter JJG365	(1～100)%	U_{rel}=2%		
20	*Fourier Transform Infrared Spectormeters	Wavelengh	C. S. for Fourier Transform Infrared Spectormeters JJF1319	(4000～400)cm^{-1}	U=0.3cm^{-1}		
21	*Iductively Coupled Plasma Mass Spectormeters	Detection limit	C. S. for Quadrupole Iductively Coupled Plasma Mass Spectormeters JJF1159	Be:≤30ng.$L^{-1/sup>}$	U_{rel}=11%		
				In:≤10ng.L^{-1}	U_{rel}=12%		
				Bi:≤10ng.L^{-1}	U_{rel}=11%		
22	*Kjeldahl nitrogen determinator	Concentration	C. S. for Elemental Analyzers JJF1321	1%～50%	U=1.2%		
23	*Carbon- sulfer Analyzer	Concentration	V. R. of Carbon-sulfer Analyzers JJG395	C:0.005%～0.010%	U=0.002%		
				C:0.010%～0.100%	U=0.005%		
				C:0.100%～1.000%	U=0.006%		
				C:1.00%～4.00%	U=0.03%		
				S:0.003%～0.010%	U=0.001%		
				S:0.010%～0.100%	U=0.002%		

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				S:0.100%～0.200%	U=0.008%		
24	*Emission Spectormeter	Detection limit	V. R. of Emission Spectormeters JJG768	ICP:Zn≤0.003mg/L	U_{rel}=13%		
				ICP:Ni≤0.01mg/L	U_{rel}=14%		
				ICP:Mn≤0.002mg/L	U_{rel}=14%		
				ICP:Cr≤0.007mg/L	U_{rel}=13%		
				ICP:Cu≤0.007mg/L	U_{rel}=11%		
				ICP:Ba≤0.001mg/L	U_{rel}=13%		
				Direct reading spectrometer:C≤0.005%	U_{rel}=19%		
				Direct reading spectrometer:Si≤0.005%	U_{rel}=18%		
				Direct reading spectrometer:Mn≤0.003%	U_{rel}=18%		
				Direct reading spectrometer:Cr≤0.003%	U_{rel}=18%		
				Direct reading spectrometer:Ni≤0.005%	U_{rel}=19%		
				Direct reading spectrometer:V≤0.001%	U_{rel}=20%		
25	Automatic Potentiometric Titrators	mV	V. R. of Automatic Potentiometric Titrator JJG814	(-2000～2000)mV	U=0.7mV		
		Capacity		(1～10) mL	U=0.003mL		
26	*Frame Photometer	Detection limit	V. R. of Frame Photometer JJG630	K:≤0.004mmol/L	U_{rel}=11%		
				Na:≤0.008mmol/L	U_{rel}=12%		

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27	*Fluorescence Spectrophotometer	Detection limit	V. R. of Fluorescence Spectrophotometers JJG537	≤5×10^{-10}g/mL	U=1×10^{-10} g/mL		
28	VOC Detector	Concentration	C. S. for Volatile Organic Compounds Photo Ionization Detectors JJF1172	(1～1000)×10^{-6}mol/mol	U_{rel}=3%		
29	*Sulfur Dioxide Gas Detector	Concentration	V. R. of Sulfur Dioxide Gas Detectors JJG551	(1～500)×10^{-6}mol/mol	U_{rel}=3%		
30	Ammonia Gas Detector	Concentration	V. R. of Ammonia Gas Detectors JJG1105	(1～100)×10^{-6}mol/mol	U_{rel}=3%		
31	Residual Chlorine Meter	Concentration	C. S. for Residual Chlorine Meter JJF1609	Total: (0.02～5.00)mg/L	U_{rel}=2%		
				Free:(0.02～5.00)mg/L	U_{rel}=3%		
32	Hand Saccharimeter(content-meter)and Hand Refractometer	Concentration	V. R. of Hand Saccharimeter(content-meter)and Hand Refractometer JJG820	(1～80)%	U_{rel}=2%		
		Refractivity		1.3330～1.5200	U=8×10^{-4}		
33	*Atomic Fluorescence Spectrophotometer	Limited calculation	V. R. of Atomic Fluorescence Spectrophotometers JJG939	As:≤0.4ng	U=0.04ng		
				Sb:≤0.4ng	U=0.03ng		
34	Turbidimeters	Turbidity	V. R. of Turbidimeters JJG880	(1～1000)NTU	U_{rel}=4%		
35	Chemical Oxygen Demand(COD) Meters	Concentration	V. R. of Chemical Oxygen Demand(COD) Meters JJG975	(1～1000) mg/L	U_{rel}=3%		
36	*Total Organic Carbon Analyzer	Concentration	V. R. of Total Organic Carbon Analyzer JJG821	TOC:(1～1000) mg/L	U_{rel}=3%		
37	*Analyzers for Oil Content in Water	Concentration	V. R. of Analyzers for Oil Content in Water JJG 950	(0～10)mg/L	U=0.2mg/L		
				(10～1000)mg/L	U_{rel}=3%		

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38	*Melting-point Measurement Instruments	Temperature	V. R. of Melting-point Measurement Instruments JJG701	(50～300)℃	U=0.2℃		
39	*Ozone Gas Analyzers	Concentration	V. R. of Ozone Gas Analyzers JJG 1077	(0.02～1.00) μ mol/mol	U_{rel}=3%		
				(1.00～400) μ mol/mol	U_{rel}=6%		
40	*Automatic Amoni Acid Analyzer	Detection limit	V. R. of Automatic Amoni Acid Analyzer JJG 1064	≤1nmol	U_{rel}=14%		
41	*Micro Oxygen Analyzers	Concentration	Verification Regulation of Micro Oxygen Analyzers JJG945	(1.～1000)×10^{-6}mol/mol	U_{rel}=3%		
42	*Determinators for Total Sulfur in Coal	Concentration	Verification Regulation of Determinators for Total Sulfur in Coal JJG1006	(0.01～1.00)%	U=0.05%		
				(1.01～4.00)%	U=0.07%		
				(4.01～6.00)%	U=0.16%		
43	*Liquid chromatograph-Atomic Fluorescence Spectrometers	Minimum detecting limited concentration	Verification Regulation of Liquid chromatograph-Atomic Fluorescence Spectrometers JJG1151	As(V)：<1.0ng	U=0.02ng		
				MMA：<0.7ng	U=0.01ng		
				DMA：<0.7ng	U=0.01ng		
44	*Flow Analyzers with Spectrophotography	Limited calculation	Calibration Specification for Flow Analyzers with Spectrophotography JJF1568	Cyanide:≤0.002 mg/L	U=0.0003mg/L		
				Volatile phenol in water: ≤0.002 mg/L	U=0.0002mg/L		
				Hexavalent chromium:≤ 0.004 mg/L	U=0.0004mg/L		
				Sulfide:≤0.005 mg/L	U=0.0006mg/L		
				Total phosphorus:≤0.01 mg/L	U=0.003mg/L		

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				Total nitrogen:≤0.04 mg/L	U=0.004mg/L		
				Ammonia nitrogen:≤0.04 mg/L	U=0.005mg/L		
				Anion active detergent:≤ 0.05 mg/L	U=0.005mg/L		
3.Ionizing radiation							
1	*Medical Diagnostic X-ray Radiation Source	Air Kerma Rate	Verification Regulation of Medical Diagnostic X-ray Radiation Source JJG744	0.1mGy/min～1Gy/min	U_{rel}=5%		
2	*Medical Diagnostic X-ray Radiation Source for Spiral Computed Tomography (CT)	CTDI	Verification Regulation of Medical Diagnostic X-ray Radiation Source for Spiral Computed Tomography (CT) JJG 961	0.1mGy～ 1Gy	U_{rel}=5%		
3	*Medical Diagnostic X-ray Radiation Source for Dental Panorama	Air Kerma Rate	Verification Regulation of Medical Diagnostic X-ray Radiation Source for Dental Panorama JJG 1101	0.1mGy/min～1Gy/min	U_{rel}=5%		
4	*X-ray Radiation Sources for Medical Computed Radiography System and Digital Radiography System	Air Kerma	Verification Regulation of X-ray Radiation Sources for Medical Computed Radiography System and Digital Radiography System JJG 1078	0.1mGy～100mGy	U_{rel}=4%		
5	*X-ray Security Inspection Equipment	Leakage of radiation dose	Calibration Specification for X-ray Security Inspection Equipment JJF 1275	1 μGy/h～1mGy/h	U_{rel}=19%		

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4.Optics							
1	Abbe Refractometer	refractiveindex	Verification Regulation of Abbe Refractometer JJG625	1.3000~1.7000	$U=7\times10^{-5}$		
5.Special calibration for Motor vehicles							
1	*Automobile Slip tester	Displacement	V.R.of Automobile Side Slip Tester JJG908	(-10～10) m/km	U=0.1 m/km		
		Force		(50～150)N	U=6N		
2	*Axle （Wheel ）Load Scales for Motor Vehicle Test	Mass	V.R.of Special Axle （Wheel ）Load Scales for Motor Vehicle Test JJG1014	20kg～5t	U_{rel}=0.3%		
3	*Roller Type Speedometer Tester	speed	V.R.of Roller Type Speedometer Tester JJG909	(20～100)km/h	U_{rel}=1.4%		
		Length		(100～250)mm	U_{rel}=0.26%		
4	*Vehicle Exhaust Emission Measuring Instruments	Gas Concentration	V. R. of Vehicle Exhaust Emission Measuring Instruments JJG688	HC: (10～9999)$\times10^{-6}$	U_{rel}=1.2%		
				CO: (0.1～14.00)$\times10^{-2}$	U_{rel}=1.8%		
				CO_2: (0.1～18.0)$\times10^{-2}$	U_{rel}=1.6%		
				NO: (10～5000)$\times10^{-6}$	U_{rel}=2.2%		
				O_2: (0.1～25.0)$\times10^{-2}$	U_{rel}=1.4%		
5	*Roller Opposite Forces Type Brake Tester	Force	V.R.of Roller Opposite Forces Type Brake Tester JJG906	(2000～30000)N	U_{rel}=1.4%		
		adhesion coefficient		0.10～0.98	U=0.08		
6	*Headlamp Testers for Motor Vehicle	Luminous intensity	V.R.of Headlamp Tester for Motor Vehicle JJG745	（8000～60000）cd	U_{rel}=6.3%		

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		Offset of optical axis		up (0.1～20)cm/dam down(0.1～40)cm/dam left(0.1～40)cm/dam right(0.1～40)cm/dam	U=1.2cm/dam		
7	*Chassis Dynamometers for Automobile Emissions Testing	Speed	C.S for Chassis Dynamometers for Automobile Emissions Testing JJF1221	(0～100)km/h	U=0.1 km/h		
		Torque		(5～2450)N	U_{rel}=0.8%		
		Time		（1～900）s	U=1.4s		
8	Motor Vehicle Tester fo Streering Force and Streering Angle	Torque	C.S of Motor Vehicle Testers for Steering Force and Steering Angle JJF1196	（20～100）Nm	U_{rel}=1.1%		
		Angel		Positive and negative direction:-1080º～1080º	U=0.8 º		
9	*Engine Speed Measuring Instruments	Rate	C.S for Motor Vehicle Engine Speed Measuring Instruments JJF1375	（500～6000）r/min	U_{rel}=0.26%		
10	*retrotrflection coefficient meters for motor vehicle's reflecting Marking	retrotrflection coefficient	Calibration specification of retrotrflection coefficient meters for motor vehicle's reflecting Marking JJF 1747	white：（20～350）cd • lx^{-1} • m^{-2},	U_{rel}=4.0%		
				yellow：（15～300）cd • lx^{-1} • m^{-2}	U_{rel}=4.0%		
				red：(10～60)cd • lx^{-1} • m^{-2}	U_{rel}=4.0%		
				green：(5～80) cd • lx^{-1} • m^{-2}	U_{rel}=4.0%		
				blue：(2～40) cd • lx^{-1} • m^{-2}	U_{rel}=4.0%		
				brown：(20～40) cd • lx^{-1} • m^{-2}	U_{rel}=4.0%		

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11	*transmittance meter of automobile	transmittance	Calibration Specification for Transmittance Meter of Automobile JJF1225	(0～100)%	U=0.70%		
12	*the diesel vehicle nitrogen oxides measuring instruments	Gas Concentration	Calibration Specification for Diesel Vehicle Nitrogen Oxides（NOx）Measuring Instruments JJF 1873	NO:（1～4000）×10^{-6}	U_{rel}=1.1%		
				NO_2:（1～1000）×10^{-6}	U_{rel}=3%		
				CO_2:（0.1～18.0）×10^{-2}	U_{rel}=1.7%		
13	*Flow Analyzer for Short Transient Loaded Mode of Gasoline Vehicles"	Gas flow	C.S of Flow Analyzer for Short Transient Loaded Mode of Gasoline Vehicles JJF1385	（95～180）L/s	U_{rel}=2.0%		
		Dilute mixture Oxygen concentration		（5～21）%	U_{rel}=2.5%		
14	Manipulating Force Tester for Automotive Brake	Force value	Calibration Specification for Manipulating Force Tester for Automotive Brake JJF 1169	Pedal force meter:（100～1000）N	U_{rel}=0.6%		
				Handbreak force meter:（2～1000）N	U_{rel}=0.4%		
6.Special calibration for Medicine							
1	*Syringe Pump and Infusion Pump	Flow	Calibration Specification for Syringe Pumps and Infusion Pumps JJF1259	(5～20)mL/h	U_{rel}=2.6%		
				(20～200)mL/h	U_{rel}=1.4%		
				(200～1000)mL/h	U_{rel}=2.4%		
2	*Lung Ventilator	Tidal Volume	Calibration Specification for Lung Ventilators JJF1234	(0.2～1)L	U_{rel}=5%		
3	*Cardiac Defibrillator	Energy	Calibration Specification for Cardiac Defibrillators JJF1149	(2~50)J	U=2.7J		
				(50～360)J	U_{rel}=6%		
4	*ELISA Analytical Instrument	Absorbance	V. R. of ELISA Analytical Instrument JJG861	0.2～1.5	U=0.012		

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5	*Pulmonary Function Measuring Instrument	vital capacity	Calibration Specification for the Pulmonary Function Measuring Instrument JJF 1213	(0.5～2)L	U=0.024L		
				(2～10)L	U_{rel}=0.74%		
6	*Medical Centrifuges	rotational speed	Calibration Specification for Medical Centrifuges JJF 2004	（20～30000）r/min	U_{rel}=0.04%		
7.Special calibration for Construction and transportation							
1	*Cement Mortar Mixer Complying	Rate	V.R.of The planet type mortar mixers JJF（JC）123	(62～300)r/min	U_{rel}=1.2%		
		Time		(20～130)s	U_{rel}=1.3%		
		Length		(7～9)mm	U_{rel}=0.6%		
2	*Mixer for Cement Paste	Rate	V.R.of Mixer for Cement Paste JJF（JC）104	(62～300)r/min	U_{rel}=1.2%		
		Time		(20～130)s	U_{rel}=1.3%		
		Length		(5～6.5)mm	U_{rel}=0.7%		