

Name: Shandong Institute of Metrology

Address: Junction of Dongfanghong East Road and Chongde Five Avenue, Dezhou, Shandong, China

Registration No. CNAS L0854

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

Effective Date: 2026-04-21 Expiry Date: 2030-02-03

## 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
1、Mechanics measuring instrument							
1	Electromagnetic Flowmeters	Flow	Verification Regulation of Electromagnetic Flowmeters JJG 1033	Liquid, DN10~DN1000: (0.006~1800) m <sup>3</sup> /h, Mass method	$U_{rel}=0.11\%$		
				Liquid, DN50~DN1000: (4.3~5551) m <sup>3</sup> /h, Master meter method	$U_{rel}=0.14\%$		
2	Ultrasonic Flowmeters	Flow	Verification Regulation of Ultrasonic Flowmeters JJG 1030	Liquid, DN10~DN1000: (0.006~1800) m <sup>3</sup> /h, Mass method	$U_{rel}=0.11\%$		
				Liquid, DN50~DN1000: (4.3~5551) m <sup>3</sup> /h, Master meter method	$U_{rel}=0.14\%$		



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№	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty ( $k=2$ )	Note	Effective Date
				Gas, DN15~DN600: (0.1~15000) m <sup>3</sup> /h	$U_{rel}=0.39\%$		
3	Turbine Flowmeter	Flow	Verification Regulation of Turbine Flowmeter JJG 1037	Liquid(Water), DN10~DN1000: (0.006~1800) m <sup>3</sup> /h, Mass method	$U_{rel}=0.07\%$		
				Liquid (Water), DN50~DN1000: (4.3~5551) m <sup>3</sup> /h, Master meter method	$U_{rel}=0.11\%$		
				Gas, DN15~DN600: (0.1~15000)m <sup>3</sup> /h	$U_{rel}=0.27\%$		
				Liquid(Oil), DN10~DN300: (0.1~300) m <sup>3</sup> /h, Mass method	$U_{rel}=0.11\%$		
				Liquid(Oil), DN10~DN300: (1.5~1000) m <sup>3</sup> /h, Master meter method	$U_{rel}=0.21\%$		
4	Vortex-shedding Flowmeter	Flow	Verification Regulation of Vortex-shedding Flowmeter JJG 1029	Liquid (Water), DN10~DN1000: (0.006~1800) m <sup>3</sup> /h, Mass method	$U_{rel}=0.21\%$		
				Liquid, DN50~DN1000: (4.3~5551) m <sup>3</sup> /h, Master meter method	$U_{rel}=0.22\%$		



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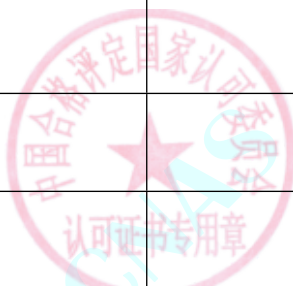
№	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty ( $k=2$ )	Note	Effective Date
				Gas, DN15~DN600: (0.1~15000)m <sup>3</sup> /h	$U_{rel}=0.39\%$		
5	Liquid Positive Displacement Flowmeter	Flow	Verification Regulation of Liquid positive displacement flowmeter JJG 667	Liquid (Water), DN10~DN1000: (0.006~1800) m <sup>3</sup> /h, Mass method	$U_{rel}=0.07\%$		
				Liquid(Water), DN50~DN1000: (4.3~5551) m <sup>3</sup> /h, Master meter method	$U_{rel}=0.11\%$		
				Liquid(Oil), DN10~DN300: (0.1~300) m <sup>3</sup> /h, Mass method	$U_{rel}=0.11\%$		
				Liquid(Oil), DN10~DN300: (1.5~1000)m <sup>3</sup> /h, Master meter method	$U_{rel}=0.21\%$		
				Liquid(Oil), DN10~DN300: (8~450) m <sup>3</sup> /h, Volume tube method	$U_{rel}=0.12\%$		
6	Differential Pressure Flowmeters	Flow	Verification Regulation of Differential Pressure Flowmeters JJG 640	Liquid, DN10~DN1000: (0.006~1800) m <sup>3</sup> /h, Mass method	$U_{rel}=0.07\%$		
				Liquid, DN50~DN1000: (4.3~5551) m <sup>3</sup> /h, Master meter method	$U_{rel}=0.11\%$		



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№	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty ( $k=2$ )	Note	Effective Date
7	Float Meter	Flow	Verification Regulation of Float Meter JJG 257	Liquid, DN10~DN150: (0.006~500) m <sup>3</sup> /h	$U=0.5\%FS$		
8	Mass Flow Meters	Flow	Verification Regulation of Coriolis Mass Flow Meters JJG 1038	Liquid(Water), DN10~DN1000: (0.006~1800) t/h, Mass method	$U_{rel}=0.07\%$		
				Liquid(Oil), DN10~DN300 : (0.1~300)m <sup>3</sup> /h, Mass method	$U_{rel}=0.09\%$		
9	Cold Potable Water Meter	Flow	Verification Regulation of Cold Potable Water Meters JJG 162	Liquid, DN6~DN50: (0.002~30)m <sup>3</sup> /h, Mass method	$U_{rel}=0.36\%$		
				Liquid, DN10~DN1000: (0.006~1800) m <sup>3</sup> /h, Mass method	$U_{rel}=0.18\%$		
				Liquid, DN50~DN1000: (4.3~5551) m <sup>3</sup> /h, Master meter method	$U_{rel}=0.20\%$		
10	Displacement Gas Meters	Flow	Verification Regulation of Displacement Gas Meters JJG 633	DN15~DN600: (0.1~15000) m <sup>3</sup> /h	$U_{rel}=0.27\%$		
11	Critical Flow Venturi Nozzle	Flow	Verification Regulation of Critical Flow Venturi Nozzle JJG 620	(0.133~50)mm, (0.01~1300)m <sup>3</sup> /h	$U_{rel}=0.11\%$		
12	Thermal Mass Gas Flowmeters	Flow	Verification Regulation of Thermal Mass Gas Flowmeters JJG 1132	Gas, DN15~DN600: (0.1~15000)m <sup>3</sup> /h	$U_{rel}=0.4\%$		



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No	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
13	*Gas Flow Calibration Facility by Means of Critical Flow Venturi Nozzles	Flow	Calibration Specification for Gas Flow Calibration Facility by Means of Critical Flow Venturi Nozzles JJF 1240	Gas, (0.016~15000)m <sup>3</sup> /h	$U_{rel}=0.23\%$		
14	Hot Water Meters	Flow	Verification Regulation of Hot Water Meters JJG 686	DN15~DN25 : (0.006~7)m <sup>3</sup> /h, Mass method	$U_{rel}=0.20\%$		
				DN50~DN400: (0.1~1200)m <sup>3</sup> /h, Mass method	$U_{rel}=0.15\%$		
				DN50~DN400: (0.5~2000)m <sup>3</sup> /h, Master meter method	$U_{rel}=0.25\%$		
15	Heat Meters	Flow	Verification Regulation of Heat Meters JJG 225	DN15~DN25: (0.006~7)m <sup>3</sup> /h, Mass method	$U_{rel}=0.20\%$		
				DN50~DN400: (0.1~1200)m <sup>3</sup> /h, Mass method	$U_{rel}=0.13\%$		
				DN50~DN400: (0.5~2000)m <sup>3</sup> /h, Master meter method	$U_{rel}=0.23\%$		
		Heat		flow rate range: (0.006~2000) m <sup>3</sup> /h, temperature difference range: (2~175)K	$U_{rel}=0.12\%$		
		Temperature		(0.1~300)°C	$U=0.014^{\circ}\text{C}$		
		Temperature Difference		(2~175)K	$U=0.021^{\circ}\text{C}$		
2、Ionizing radiation measuring instrument							



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№	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty (k=2)	Note	Effective Date
1	Portable Ambient Dose Equivalent(Rate) Meters and Monitors for X and gamma Radiations	Ambient Dose Equivalent Rate	Verification regulation of Portable Ambient Dose Equivalent(Rate) Meters and Monitors for X and gamma Radiations JJG 393	$(1 \times 10^{-6} \sim 1) \text{Sv} \cdot \text{h}^{-1}$	$U_{\text{rel}}=4.8\%$		
2	X and gamma radiation air kerma ratemeters for environmental monitoring	Air Kerma Rate	Verification regulation of X and Gamma Radiation Air Kerma Ratemeters for Environmental Monitoring JJG 521	$(1 \times 10^{-8} \sim 1 \times 10^{-4}) \text{Gy} \cdot \text{h}^{-1}$	$U_{\text{rel}}=4.8\%$		
3	Personal Dose Equivalent $H_p(10)$ Monitors for X and gamma radiation	Personal Dose Equivalent Rate	Verification regulation of Personal Dose Equivalent $H_p(10)$ Monitors for X and gamma radiation JJG 1009	$(1 \times 10^{-6} \sim 1) \text{Sv} \cdot \text{h}^{-1}$	$U_{\text{rel}}=4.8\%$		
4	Personal dose equivalent rate warning devices for X and $\gamma$ radiation	Personal Dose Equivalent Rate	Verification regulation of Personal Dose Equivalent Rate Warning Devices for X and $\gamma$ Radiation JJG 962	$(1 \times 10^{-6} \sim 1) \text{Sv} \cdot \text{h}^{-1}$	$U_{\text{rel}}=4.8\%$		
5	Diagnostic Dosimeters	Air Kerma Rate	Calibration specification for Diagnostic Dosimeters JJF 1621	$(6 \times 10^{-5} \sim 1) \text{Gy/min}$	$U_{\text{rel}}=3.2\%$		
6	Non-invasive X-ray tube voltage meters used in medical diagnosis	X-ray tube voltage	Calibration specification for Non-invasive X-ray tube voltage meters used in medical diagnosis JJF 1474	$(40 \sim 150) \text{kV}$	$U_{\text{rel}}=0.8\%$		



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No	Instrument	Measurand	Calibration Method	Range	Expanded Uncertainty ( $k=2$ )	Note	Effective Date
7	Thermoluminescence dosimetry systems used in personal and environmental monitoring for X and $\gamma$ radiation	Dose	Thermoluminescence Dosimetry Systems Used in Personal and Environmental Monitoring for X and $\gamma$ Radiation JJG 593	0.01mSv~1Sv	$U_{rel}=4.6\%$		



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