

Acoustics, Ultrasound and Vibration, China, NIM (National Institute of Metrology)

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty						
Quantity	Instrument or Artifact: Measurand	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage factor	Level of Confidence	Relative expanded uncertainty ?	NMI Internal Identifier	Comments
Pressure sensitivity level	Measurement microphone type LS1P	IEC 61094- 2: 2009			dB (reference: 1 V/Pa)	Frequency	2 Hz to 4 Hz	0.20	dB	2	95%	No	AUV-AU-1	Approved on 22 December 2016
Pressure sensitivity level	Measurement microphone type LS1P	IEC 61094- 2: 2009			dB (reference: 1 V/Pa)	Frequency	5 Hz to 8 Hz	0.10	dB	2	95%	No	AUV-AU-2	Approved on 22 December 2016
Pressure sensitivity level	Measurement microphone type LS1P	IEC 61094- 2: 2009			dB (reference: 1 V/Pa)	Frequency	10 Hz to 50 Hz	0.08	dB	2	95%	No	AUV-AU-3	Approved on 22 December 2016
Pressure sensitivity level	Measurement microphone type LS1P	IEC 61094- 2: 2009			dB (reference: 1 V/Pa)	Frequency	63 Hz to 4 kHz	0.05	dB	2	95%	No	AUV-AU-4	Approved on 22 December 2016
Pressure sensitivity level	Measurement microphone type LS1P	IEC 61094- 2: 2009			dB (reference: 1 V/Pa)	Frequency	5 kHz to 8 kHz	0.06	dB	2	95%	No	AUV-AU-5	Approved on 22 December 2016
Pressure sensitivity level	Measurement microphone type LS1P	IEC 61094- 2: 2009			dB (reference: 1 V/Pa)	Frequency	10 kHz	0.08	dB	2	95%	No	AUV-AU-6	Approved on 22 December 2016
Pressure sensitivity level	Measurement microphone type LS2P	IEC 61094- 2: 2009			dB (reference: 1 V/Pa)	Frequency	20 Hz to 50 Hz	0.12	dB	2	95%	No	AUV-AU-7	Approved on 22 December 2016
Pressure sensitivity level	Measurement microphone type LS2P	IEC 61094- 2: 2009			dB (reference: 1 V/Pa)	Frequency	63 Hz to 10 kHz	0.05	dB	2	95%	No	AUV-AU-8	Approved on 22 December 2016
Pressure sensitivity level	Measurement microphone type LS2P	IEC 61094- 2: 2009			dB (reference: 1 V/Pa)	Frequency	12.5 KHz to 20 kHz	0.10	dB	2	95%	No	AUV-AU-9	Approved on 22 December 2016

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Pressure sensitivity level	Measurement microphone type LS2P	IEC 61094- 2: 2009			dB (reference: 1 V/Pa)	Frequency	25 kHz	0.12	dB	2	95%	No	AUV-AU-10	Approved on 22 December 2016
Sound pressure response level	Sound level meter	Sequential comparison			dB (reference: 20 µPa)	Frequency	10 Hz to 16 Hz	0.5	dB	2	95%	No	AUV-AU-11	Approved on 22 December 2016
Sound pressure response level	Sound level meter	Sequential comparison			dB (reference: 20 µPa)	Frequency	20 Hz to 200 Hz	0.5	dB	2	95%	No	AUV-AU-12	Approved on 22 December 2016
Sound pressure response level	Sound level meter	Sequential comparison			dB (reference: 20 µPa)	Frequency	250 Hz to 400 Hz	0.4	dB	2	95%	No	AUV-AU-13	Approved on 22 December 2016
Free-field response level	Sound level meter	Sequential comparison			dB (reference: 20 µPa)	Frequency	500 Hz to 1.25 kHz	0.4	dB	2	95%	No	AUV-AU-14	Approved on 22 December 2016
Free-field response level	Sound level meter	Sequential comparison			dB (reference: 20 µPa)	Frequency	1.6 kHz to 10 kHz	0.6	dB	2	95%	No	AUV-AU-15	Approved on 22 December 2016
Free-field response level	Sound level meter	Sequential comparison			dB (reference: 20 µPa)	Frequency	12.5 kHz to 20 kHz	1.0	dB	2	95%	No	AUV-AU-16	Approved on 22 December 2016
Sound pressure level	Sound calibrator, single frequency 250 Hz to 1 kHz	IEC60942: 2003	70	130	dB (reference: 20 µPa)	Microphone type	LS1P	0.09	dB	2	95%	No	AUV-AU-17	Approved on 22 December 2016
Sound pressure level	Sound calibrator, single frequency 250 Hz to 1 kHz	IEC60942: 2003	70	130	dB (reference: 20 µPa)	Microphone type	LS2P	0.09	dB	2	95%	No	AUV-AU-18	Approved on 22 December 2016

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Sound pressure level	Sound calibrator, multi-frequency	IEC60942: 2003	70	130	dB (reference: 20 µPa)	Frequency	31.5 Hz to 4 kHz	0.10	dB	2	95%	No	AUV-AU-19	Approved on 22 December 2016
						Microphone type	LS2P							
Sound pressure level	Sound calibrator, multi-frequency	IEC60942: 2003	70	130	dB (reference: 20 µPa)	Frequency	8 kHz to 10 kHz	0.15	dB	2	95%	No	AUV-AU-20	Approved on 22 December 2016
						Microphone type	LS2P							
Sound pressure level	Sound calibrator, multi-frequency	IEC60942: 2003	70	130	dB (reference: 20 µPa)	Frequency	12.5 kHz to 16 kHz	0.20	dB	2	95%	No	AUV-AU-21	Approved on 22 December 2016
						Microphone type	LS2P							
System response level	Artificial ear system	Sequential comparison			dB (reference: 20 µPa)	Frequency	50 Hz to 10 kHz	1.0	dB	2	95%	No	AUV-AU-22	Approved on 22 December 2016
Ultrasonic power	Ultrasonic source transducer	IEC 61161-2013 Radiation force balance	3	500	mW	Frequency	1 MHz to 5 MHz	5	%	2	95%	Yes	AUV-AU-23	Approved on 22 December 2016
Ultrasonic power	Ultrasonic source transducer	IEC 61161-2013 Radiation force balance	0.5	20	W	Frequency	1 MHz to 5 MHz	5	%	2	95%	Yes	AUV-AU-24	Approved on 22 December 2016
Ultrasonic power	Ultrasonic source transducer	IEC 61161-2013 Radiation force balance	3	100	mW	Frequency	5 MHz to 10 MHz	5	%	2	95%	Yes	AUV-AU-25	Approved on 22 December 2016

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Quantity	Instrument or Artifact: Measurand	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage factor	Level of Confidence	Relative expanded uncertainty ?			
Charge sensitivity (modulus)	Accelerometer	ISO 16063-11			pC/(m/s ²)	Frequency	0.1 Hz to 5 kHz	0.5	%	2	95%	Yes	AUV-V-1	Approved on 22 December 2016	
Charge sensitivity (modulus)	Accelerometer	ISO 16063-11			pC/(m/s ²)	Frequency	>5 kHz to 10 kHz	1.0	%	2	95%	Yes	AUV-V-2	Approved on 22 December 2016	
Charge sensitivity (modulus)	Accelerometer	ISO 16063-11			pC/(m/s ²)	Frequency	>10 kHz to 20 kHz	1.5	%	2	95%	Yes	AUV-V-3	Approved on 22 December 2016	
Charge sensitivity (phase shift)	Accelerometer	ISO 16063-11	0	360	°	Frequency	0.1Hz to 1 kHz	0.5	°	2	95%	No	AUV-V-4	Approved on 22 December 2016	
Charge sensitivity (phase shift)	Accelerometer	ISO 16063-11	0	360	°	Frequency	>1 kHz to 5 kHz	0.75	°	2	95%	No	AUV-V-5	Approved on 22 December 2016	
Charge sensitivity (phase shift)	Accelerometer	ISO 16063-11	0	360	°	Frequency	>5 kHz to 10 kHz	1.0	°	2	95%	No	AUV-V-6	Approved on 22 December 2016	
Charge sensitivity (modulus)	Accelerometer	ISO 16063-21			pC/(m/s ²)	Frequency	1.0Hz to 5 kHz	1.5	%	2	95%	Yes	AUV-V-7	Approved on 22 December 2016	
Charge sensitivity (modulus)	Accelerometer	ISO 16063-21			pC/(m/s ²)	Frequency	>5 kHz to 10 kHz	2.0	%	2	95%	Yes	AUV-V-8	Approved on 22 December 2016	
Charge sensitivity (phase shift)	Accelerometer	ISO 16063-21	0	360	°	Frequency	1.0Hz to 5 kHz	1.2	°	2	95%	No	AUV-V-9	Approved on 22 December 2016	

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Quantity	Instrument or Artifact: Measurand	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage factor	Level of Confidence	Relative expanded uncertainty ?		
Charge sensitivity (phase shift)	Accelerometer	ISO 16063-21	0	360	°	Frequency	>5 kHz to 10 kHz	2.5	°	2	95%	No	AUV-V-10	Approved on 22 December 2016
Voltage sensitivity (modulus)	Acceleration measuring chain	ISO 16063-11			mV/(m/s ²)	Frequency	0.1Hz to 5 kHz	0.5	%	2	95%	Yes	AUV-V-11	Approved on 22 December 2016
Voltage sensitivity (modulus)	Acceleration measuring chain	ISO 16063-11			mV/(m/s ²)	Frequency	>5 kHz to 10 kHz	1.0	%	2	95%	Yes	AUV-V-12	Approved on 22 December 2016
Voltage sensitivity (modulus)	Acceleration measuring chain	ISO 16063-11			mV/(m/s ²)	Frequency	>10 kHz to 20 kHz	1.5	%	2	95%	Yes	AUV-V-13	Approved on 22 December 2016
Voltage sensitivity (phase shift)	Acceleration measuring chain	ISO 16063-11	0	360	°	Frequency	0.1 Hz to 1 kHz	0.5	°	2	95%	No	AUV-V-14	Approved on 22 December 2016
Voltage sensitivity (phase shift)	Acceleration measuring chain	ISO 16063-11	0	360	°	Frequency	>1 kHz to 5 kHz	0.75	°	2	95%	No	AUV-V-15	Approved on 22 December 2016
Voltage sensitivity (phase shift)	Acceleration measuring chain	ISO 16063-11	0	360	°	Frequency	>5 kHz to 10 kHz	1.0	°	2	95%	No	AUV-V-16	Approved on 22 December 2016
Voltage sensitivity (modulus)	Acceleration measuring chain	ISO 16063-21			mV/(m/s ²)	Frequency	1.0Hz to 5 kHz	1.5	%	2	95%	Yes	AUV-V-17	Approved on 22 December 2016
Voltage sensitivity (modulus)	Acceleration measuring chain	ISO 16063-21			mV/(m/s ²)	Frequency	>5 kHz to 10 kHz	2.0	%	2	95%	Yes	AUV-V-18	Approved on 22 December 2016

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Voltage sensitivity (modulus)	Acceleration measuring chain	ISO 16063-21	0	360	°	Frequency	1.0 Hz to 5 kHz	1.2	°	2	95%	No	AUV-V-19	Approved on 22 December 2016	
Voltage sensitivity (modulus)	Acceleration measuring chain	ISO 16063-21	0	360	°	Frequency	>5 kHz to 10 kHz	2.5	°	2	95%	No	AUV-V-20	Approved on 22 December 2016	
Acceleration (modulus)	Acceleration measuring instrument (with accelerometer)	ISO 16063-11	0.01	100	m/s ²	Frequency	0.1Hz to 5 kHz	0.5	%	2	95%	Yes	AUV-V-21	Approved on 22 December 2016	
Acceleration (modulus)	Acceleration measuring instrument (with accelerometer)	ISO 16063-11	0.4	100	m/s ²	Frequency	>5 kHz to 10 kHz	1.0	%	2	95%	Yes	AUV-V-22	Approved on 22 December 2016	
Acceleration (modulus)	Acceleration measuring instrument (with accelerometer)	ISO 16063-11	0.1	2500	m/s ²	Frequency	>10 kHz to 20 kHz	1.5	%	2	95%	Yes	AUV-V-23	Approved on 22 December 2016	
Acceleration (modulus)	Acceleration measuring instrument (with accelerometer)	ISO 16063-21	0.01	100	m/s ²	Frequency	1.0Hz to 5kHz	1.5	%	2	95%	Yes	AUV-V-24	Approved on 22 December 2016	
Acceleration (modulus)	Acceleration measuring instrument (with accelerometer)	ISO 16063-21	0.01	100	m/s ²	Frequency	>5 kHz to 10 kHz	2.0	%	2	95%	Yes	AUV-V-25	Approved on 22 December 2016	
Acceleration (shock, modulus)	Acceleration measuring instrument	ISO 16063-13	50	20000	m/s ²	Shock duration	0.2 ms to 10 ms	1.0	%	2	95%	Yes	AUV-V-26	Approved on 22 December 2016	
Acceleration (shock, modulus)	Acceleration measuring instrument	ISO 16063-13	>20000	100000	m/s ²	Shock duration	0.05 ms to 0.2 ms	2.0	%	2	95%	Yes	AUV-V-27	Approved on 22 December 2016	



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Shock sensitivity (charge, modulus)	Accelerometer	ISO 16063-13			pC/(m/s ²)	Peak value	50 m/s ² to 20000 m/s ²	1.0	%	2	95%	Yes	AUV-V-28	Approved on 22 December 2016
						Shock duration	0.2 ms to 10 ms							
Shock sensitivity (charge, modulus)	Accelerometer	ISO 16063-13			pC/(m/s ²)	Peak value	>20000 m/s ² to 100000 m/s ²	2.0	%	2	95%	Yes	AUV-V-29	Approved on 22 December 2016
						Shock duration	0.05 ms to 0.2 ms							
Shock sensitivity (voltage, modulus)	Acceleration measuring chain	ISO 16063-13			V/(m/s ²)	Peak value	50 m/s ² to 20000 m/s ²	1.0	%	2	95%	Yes	AUV-V-30	Approved on 22 December 2016
						Shock duration	0.2 ms to 10 ms							
Shock sensitivity (voltage, modulus)	Acceleration measuring chain	ISO 16063-13			V/(m/s ²)	Peak value	>20000 m/s ² to 100000 m/s ²	2.0	%	2	95%	Yes	AUV-V-31	Approved on 22 December 2016
						Shock duration	0.05 ms to 0.2 ms							