

Acoustics, Ultrasound and Vibration, United Kingdom, NPL (National Physical laboratory)



Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty						
Quantity	Instrument or Artifact	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	NMI Service Identifier	Comments
Free-field sensitivity level	Measurement microphone	Sequential comparison			dB (reference: 1 V/Pa)	Frequency	31.5 Hz to 5 kHz	0.2	dB	2	95%	No	AA/02/01	Approved on 29 September 2004
Free-field sensitivity level	Measurement microphone	Sequential comparison			dB (reference: 1 V/Pa)	Frequency	6.3 kHz to 10 kHz	0.3	dB	2	95%	No	AA/02/01	Approved on 29 September 2004
Free-field sensitivity level	Measurement microphone	Sequential comparison			dB (reference: 1 V/Pa)	Frequency	12.5 kHz	0.4	dB	2	95%	No	AA/02/01	Approved on 29 September 2004
Free-field sensitivity level	Measurement microphone system	Sequential comparison			dB (reference: 1 V/Pa)	Frequency	31.5 Hz to 5 kHz	0.2	dB	2	95%	No	AA/02/01	Approved on 29 September 2004
Free-field sensitivity level	Measurement microphone system	Sequential comparison			dB (reference: 1 V/Pa)	Frequency	6.3 kHz to 10 kHz	0.3	dB	2	95%	No	AA/02/01	Approved on 29 September 2004
Free-field sensitivity level	Measurement microphone system	Sequential comparison			dB (reference: 1 V/Pa)	Frequency	12.5 kHz	0.5	dB	2	95%	No	AA/02/01	Approved on 29 September 2004
Free-field response level	Sound level meter	Sequential comparison			dB (reference: true sound pressure)	Frequency	31.5 Hz to 5 kHz	0.2	dB	2	95%	No	AA/03/02	Approved on 29 September 2004
Free-field response level	Sound level meter	Sequential comparison			dB (reference: true sound pressure)	Frequency	6.3 kHz to 10 kHz	0.3	dB	2	95%	No	AA/03/02	Approved on 29 September 2004
Free-field response level	Sound level meter	Sequential comparison			dB (reference: true sound pressure)	Frequency	12.5 kHz	0.5	dB	2	95%	No	AA/03/02	Approved on 29 September 2004
Sound pressure level	Pistonphone or sound calibrator, single frequency 125 Hz to 1 kHz	Calibrated measurement microphone	70	130	dB (reference: 20 μ Pa)	Microphone type	LS1P	0.05	dB	2	95%	No	AA/04/01	Approved on 29 September 2004
Sound pressure level	Pistonphone or sound calibrator, single frequency 125 Hz to 1 kHz	Calibrated measurement microphone	70	130	dB (reference: 20 μ Pa)	Microphone type	WS1P	0.06	dB	2	95%	No	AA/04/01	Approved on 29 September 2004

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Sound pressure level	Pistonphone or sound calibrator, single frequency 125 Hz to 1 kHz	Calibrated measurement microphone	70	130	dB (reference: 20 μ Pa)	Microphone type	LS2P	0.05	dB	2	95%	No	AA/04/01	Approved on 29 September 2004
Sound pressure level	Pistonphone or sound calibrator, single frequency 125 Hz to 1 kHz	Calibrated measurement microphone	70	130	dB (reference: 20 μ Pa)	Microphone type	WS2P	0.05	dB	2	95%	No	AA/04/01	Approved on 29 September 2004
Sound pressure level	Pistonphone or sound calibrator, single frequency 125 Hz to 1 kHz	Calibrated measurement microphone	70	130	dB (reference: 20 μ Pa)	Microphone type	WS3P	0.06	dB	2	95%	No	AA/04/01	Approved on 29 September 2004
Sound pressure level	Sound calibrator, multi - frequency	Calibrated measurement microphone	70	115	dB (reference: 20 μ Pa)	Frequency	31.5 Hz to 4 kHz	0.1	dB	2	95%	No	AA/04/01	Approved on 29 September 2004
						Microphone type	LS2P							
Sound pressure level	Sound calibrator, multi - frequency	Calibrated measurement microphone	70	115	dB (reference: 20 μ Pa)	Frequency	8 kHz to 12.5 kHz	0.15	dB	2	95%	No	AA/04/01	Approved on 29 September 2004
						Microphone type	LS2P							
Pressure sensitivity level	Measurement microphone type LS1	IEC 61094-2:1992			dB (reference: 1 V/Pa)	Frequency	63 Hz to 2.5 kHz	0.03	dB	2	95%	No	AA/01/01	Approved on 29 September 2004
Pressure sensitivity level	Measurement microphone type LS1	IEC 61094-2:1992			dB (reference: 1 V/Pa)	Frequency	3.15 kHz to 4 kHz	0.04	dB	2	95%	No	AA/01/01	Approved on 29 September 2004
Pressure sensitivity level	Measurement microphone type LS1	IEC 61094-2:1992			dB (reference: 1 V/Pa)	Frequency	5 kHz to 8 kHz	0.05	dB	2	95%	No	AA/01/01	Approved on 29 September 2004
Pressure sensitivity level	Measurement microphone type LS1	IEC 61094-2:1992			dB (reference: 1 V/Pa)	Frequency	10 kHz	0.10	dB	2	95%	No	AA/01/01	Approved on 29 September 2004

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Quantity	Instrument or Artifact	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	NMI Service Identifier	Comments
Pressure sensitivity level	Measurement microphone type LS2	IEC 61094-2:1992			dB (reference: 1 V/Pa)	Frequency	63 Hz to 5 kHz	0.03	dB	2	95%	No	AA/01/01	Approved on 29 September 2004
Pressure sensitivity level	Measurement microphone type LS2	IEC 61094-2:1992			dB (reference: 1 V/Pa)	Frequency	6.3 kHz	0.04	dB	2	95%	No	AA/01/01	Approved on 29 September 2004
Pressure sensitivity level	Measurement microphone type LS2	IEC 61094-2:1992			dB (reference: 1 V/Pa)	Frequency	8 kHz	0.05	dB	2	95%	No	AA/01/01	Approved on 29 September 2004
Pressure sensitivity level	Measurement microphone type LS2	IEC 61094-2:1992			dB (reference: 1 V/Pa)	Frequency	10 kHz	0.06	dB	2	95%	No	AA/01/01	Approved on 29 September 2004
Pressure sensitivity level	Measurement microphone type LS2	IEC 61094-2:1992			dB (reference: 1 V/Pa)	Frequency	12.5 kHz	0.08	dB	2	95%	No	AA/01/01	Approved on 29 September 2004
Pressure sensitivity level	Measurement microphone type LS2	IEC 61094-2:1992			dB (reference: 1 V/Pa)	Frequency	16 kHz	0.10	dB	2	95%	No	AA/01/01	Approved on 29 September 2004
Pressure sensitivity level	Measurement microphone type LS2	IEC 61094-2:1992			dB (reference: 1 V/Pa)	Frequency	20 kHz	0.18	dB	2	95%	No	AA/01/01	Approved on 29 September 2004
System response level	Reference coupler system	Sequential comparison			dB (reference: true sound pressure)	Frequency	125 Hz to 8 kHz	0.2	dB	2	95%	No	AA/06/01	Approved on 29 September 2004
System response level	Artificial ear system	Sequential comparison			dB (reference: true sound pressure)	Frequency	125 Hz to 8 kHz	0.2	dB	2	95%	No	AA/06/01	Approved on 29 September 2004
Force response level	Mechanical coupler system	Calibrated impedance head			dB (reference: reference equivalent threshold force)	Frequency	250 Hz to 4 kHz	0.3	dB	2	95%	No	AA/06/02	Approved on 29 September 2004

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Quantity	Instrument or Artifact	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	NMI Service Identifier	Comments
Free-field sensitivity	Hydrophone	Comparison with a secondary hydrophone in a non-linearly distorted sound field			$\mu\text{V}/\text{Pa}$	Frequency	1 MHz to 8 MHz	6	%	2	95%	Yes	AW/07/01	Approved on 29 September 2004
Free-field sensitivity	Hydrophone	Comparison with a secondary hydrophone in a non-linearly distorted sound field			$\mu\text{V}/\text{Pa}$	Frequency	9 MHz to 12 MHz	7	%	2	95%	Yes	AW/07/01	Approved on 29 September 2004
Free-field sensitivity	Hydrophone	Comparison with a secondary hydrophone in a non-linearly distorted sound field			$\mu\text{V}/\text{Pa}$	Frequency	13 MHz to 16 MHz	8	%	2	95%	Yes	AW/07/01	Approved on 29 September 2004
Free-field sensitivity	Hydrophone	Comparison with a secondary hydrophone in a non-linearly distorted sound field			$\mu\text{V}/\text{Pa}$	Frequency	17 MHz to 20 MHz	11	%	2	95%	Yes	AW/07/01	Approved on 29 September 2004
Free-field sensitivity level	Reference measuring hydrophones/projectors	Three-transducer spherical wave reciprocity in a laboratory tank (IEC 565:1977)			dB (reference: $1 \text{ V}/\mu\text{Pa}$)	Frequency	1 kHz to 2 kHz	0.7	dB	2	95%	No	AW/10/01	Approved on 29 September 2004

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Quantity	Instrument or Artifact	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?		
Free-field sensitivity level	Reference measuring hydrophones/projectors	Three-transducer spherical wave reciprocity in a laboratory tank (IEC 565: 1977)			dB (reference: 1 V/ μ Pa)	Frequency	2 kHz to 500 kHz	0.5	dB	2	95%	No	AW/10/01	Approved on 29 September 2004
Free-field sensitivity level	Reference measuring hydrophones	Comparison with reference hydrophone (IEC 565: 1977)			dB (reference: 1 V/ μ Pa)	Frequency	1 kHz to 2 kHz	0.9	dB	2	95%	No	AW/10/02	Approved on 29 September 2004
Free-field sensitivity level	Reference measuring hydrophones	Comparison with reference hydrophone (IEC 565: 1977)			dB (reference: 1 V/ μ Pa)	Frequency	2 kHz to 1 MHz	0.7	dB	2	95%	No	AW/10/02	Approved on 29 September 2004
Pressure sensitivity level	Reference measuring hydrophones	Comparison with a calibrated reference microphone			dB (reference: 1 V/ μ Pa)	Frequency	25 Hz to 400 Hz	0.5	dB	2	95%	No	AW/10/03	Approved on 29 September 2004
Ultrasonic power	Plane piston ultrasound transducer and generator	Primary standard radiation force balance	0.0005	1	W	Frequency	0.8 MHz to 20 MHz	2.5 to 6	%	2	95%	Yes	AW/08/05	Approved on 29 September 2004
Ultrasonic power	Plane piston ultrasound transducer and generator	Calibrated radiation force balance	0.50	20	W	Frequency	0.8 MHz to 3 MHz	3.5 to 5	%	2	95%	Yes	AW/08/05	Approved on 29 September 2004