



Appendix A12.2: Calibration Certificates

1 Sound Level Meter Calibration Certificate

Certificate of Calibration					
Equipment Details					
Instrument Manufacturer	Cirrus Research Plc				
Instrument Type	CR:171C				
Description	Sound Level Meter				
Serial Number	G061732				
Calibration Procedure					
The instrument detailed above has been calibrated to the publish test and calibration data as detailed in the instrument hand book, using the techniques recommended in the latest revisions of the International Standards IEC 61672-1:2013, IEC 61672-1:2002, IEC 60651:1979, IEC 60804:2001, IEC 61260:1995, IEC 60942:2003, IEC 60942:1997, IEC 61252:1993, ANSI S1.4-1983, ANSI S1.11-1986 and ANSI S1.43-1997 where applicable. Sound Level Meters: All Calibration procedures were carried out by substituting the microphone capsule with a suitable electrical signal, apart from the final acoustic calibration.					
Calibration Traceability					
The equipment detailed above was calibrated against the calibration laboratory standards held by Cirrus Research plc. These are traceable to International Standards {A.0.6}. The standards are:					
Microphone Type	GRAS 40AP	Serial Number	173198	Calibration Ref.	0170
Calibrator Type	B&K 4231	Serial Number	2564324	Calibration Ref.	A1914
Calibrator Type	B&K 4231	Serial Number	2564325	Calibration Ref.	A1915
Calibrator Type	B&K 4231	Serial Number	2594796	Calibration Ref.	A1916
Calibrated by					
Calibration Date	15 September 2017				
Calibration Certificate Number	252533				
This Calibration Certificate is valid for 24 months from the date above.					
Cirrus Research plc, Acoustic House, Bridlington Road, Hunmanby, North Yorkshire, YO14 0PH Telephone: +44 (0) 1723 891655 Fax: +44 (0) 1723 891742 Email: sales@cirrusresearch.co.uk					

2 Acoustic Calibrator Calibration Certificate

Certificate of Calibration



Certificate Number: **122494**
 Date of Issue: **28 September 2018**

Instrument

Manufacturer: **Cirrus Research plc** Serial Number: **60601**
 Model Number: **CR:515**

Calibration Procedure

The sound calibrator detailed above has been calibrated to the published data as described in the operating manual and in the half-inch configuration. The procedures and techniques used are as described in IEC 60942:2003 Annex B – Periodic Tests and three determinations of the sound pressure level, frequency and total distortion were made.

The sound pressure level was measured using a WS2F condenser microphone type MK:224 manufactured by Cirrus Research plc.

The results have been corrected to the reference pressure of 101.33 kPa using the manufacturer s data.

Date of Calibration: **28 September 2018**

Initial Calibration Results

Measurement	Level (dB)	Frequency (Hz)	Distortion (% THD + Noise)
1	94.06	1000.0	0.39
2	94.06	1000.0	0.39
3	94.09	1000.0	0.55
Average	94.07	1000.0	0.44
Uncertainty	± 0.13	± 0.1	± 0.10

The reported uncertainties of measurement are expanded by a coverage factor of k=2, providing a 95% confidence level.

Adjusted Calibration Results

Measurement	Level (dB)	Frequency (Hz)	Distortion (% THD + Noise)
1	94.00	1000.0	0.39
2	94.01	1000.0	0.48
3	94.01	1000.0	0.22
Average	94.01	1000.0	0.36
Uncertainty	± 0.13	± 0.1	± 0.10

The reported uncertainties of measurement are expanded by a coverage factor of k=2, providing a 95% confidence level.

Cirrus Research plc, Acoustic House, Bridlington Road
 Hunmanby, North Yorkshire, YO14 0PH, United Kingdom
Telephone: 0845 230 2434 **Int:** +44 1723 891655
Email: sales@cirrusresearch.co.uk
Web: www.cirrusresearch.co.uk
 UK Registration No. 987160



Environmental Conditions

Pressure: 102.53 kPa
Temperature: 23.6 °C
Humidity: 47.2 %

Evidence of Pattern Approval

The manufacturer's product information indicates that this model of sound calibrator has been formally pattern approved to IEC 60942:2003 Annex A to Class 1. This has been confirmed with the Physikalisch-Technische Bundesanstalt (PTB).

Statement of Calibration

As public evidence was available, from a testing organisation responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the Class 1 requirements of IEC 60942:2003.

Calibration Laboratory

Laboratory: Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Test Engineer: Craig Scott

