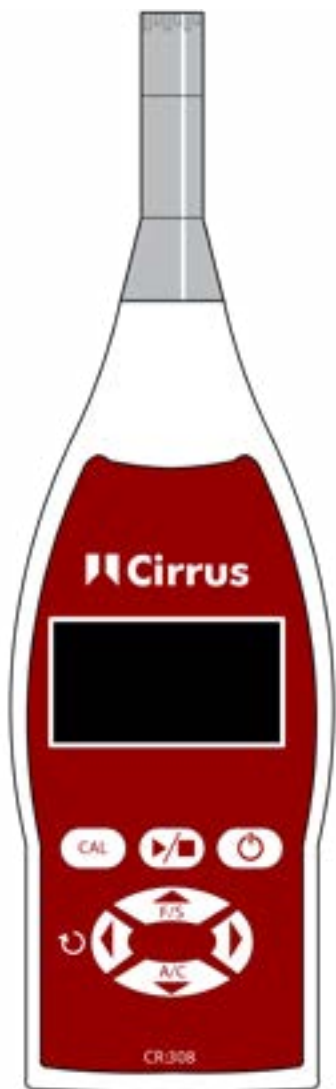


 CR:308  CR:310



Instrument Handbook

CR308/310 Sound
Level Meters

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1. Overview

Welcome to your new CR:308/310 series sound level meter. You've taken a great step towards protecting people's hearing and this entry level meter will make it quick and easy for you to take simple noise measurements, providing you with the basic data you need.

The CR:308 is a general purpose digital sound level meter, designed to IEC 61672 to Class 2. The instrument has 'F' (fast) and 'S' (slow) time response and 'A' and 'C' frequency weightings. Additional features include max and min hold for the duration of the measurement, LCpk, and limit alarm, which you can set to indicate if the threshold you have set has been exceeded.

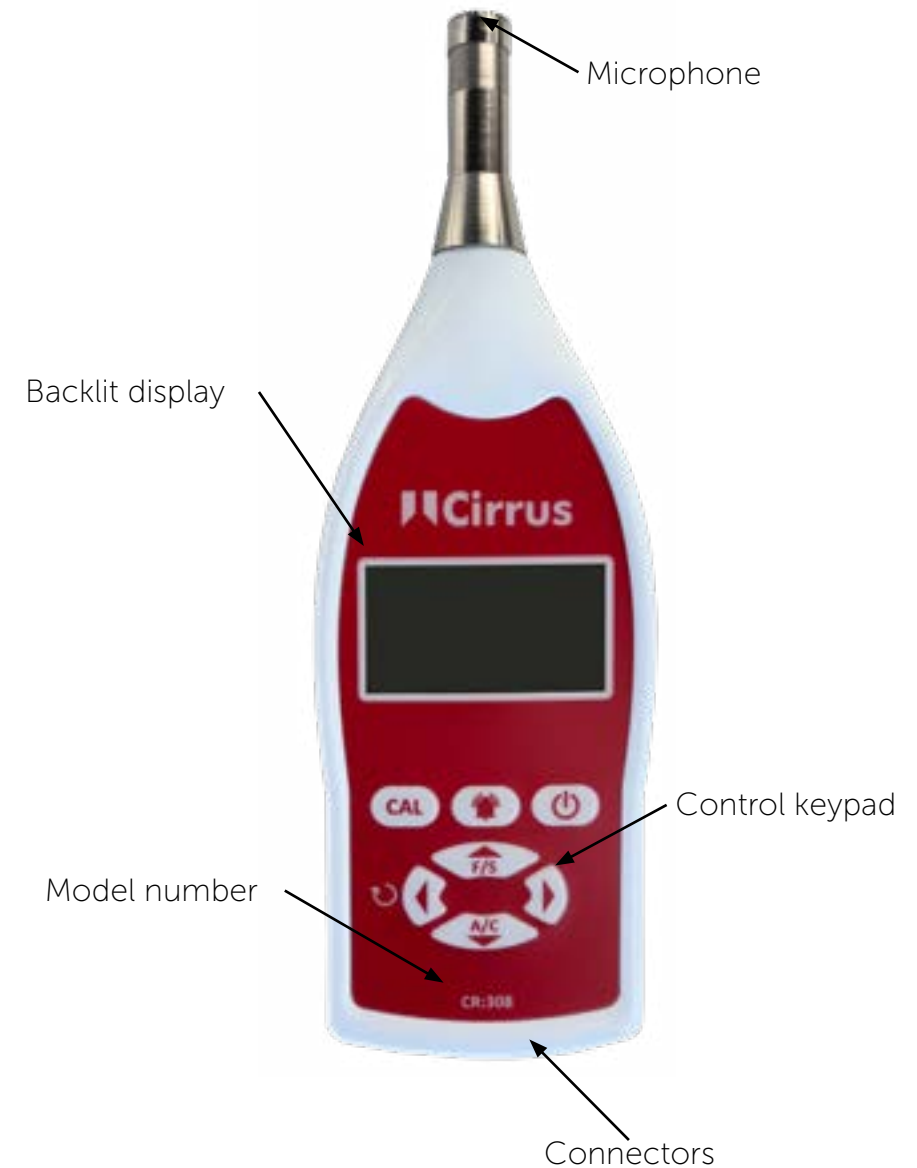
With the exception of the alarm indication, the CR:310 includes the features of the CR:308, with the addition of increased measurement capability, including integrating averaging, and the ability to print results directly from the meter.

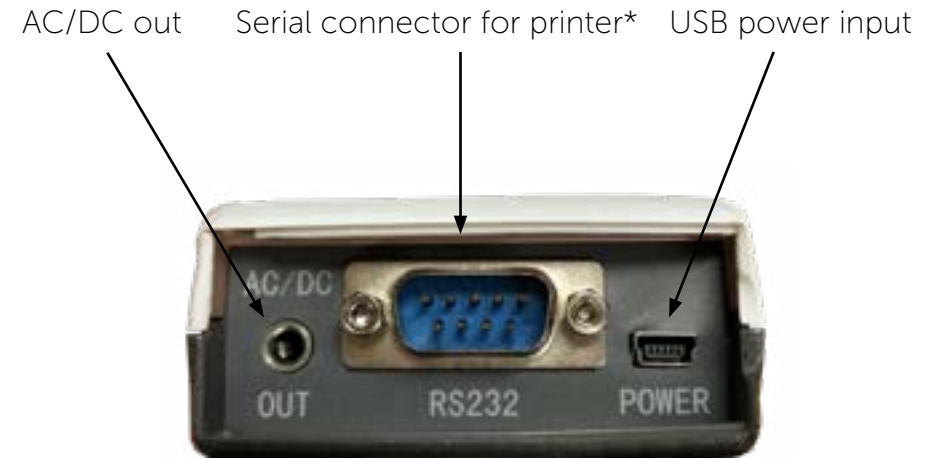
2. First time use

Before using your meter for the first time, please check the contents of your instrument's case, which should include the following:

- Sound level meter and Class 2 microphone
- Windshield
- 2 x AA batteries

Before starting a measurement, remove the black microphone protective cap (if fitted) and where necessary, place the windshield carefully over the end of the microphone capsule.

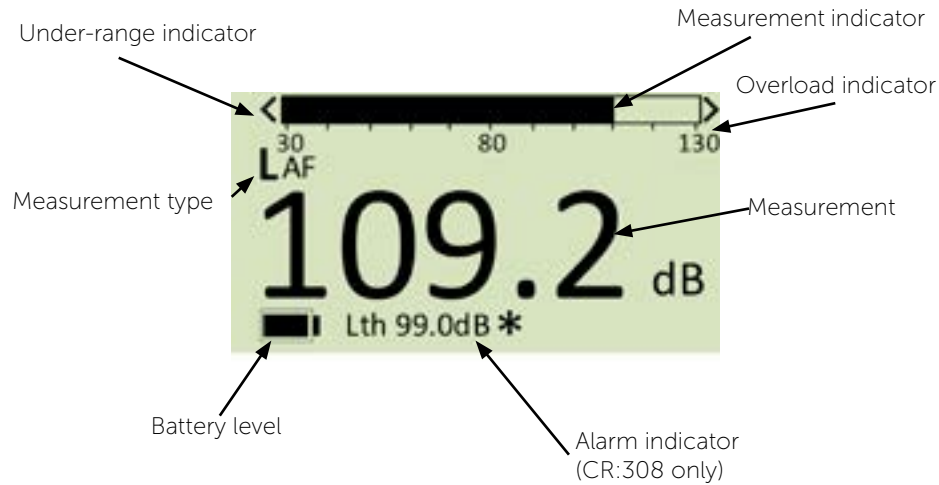




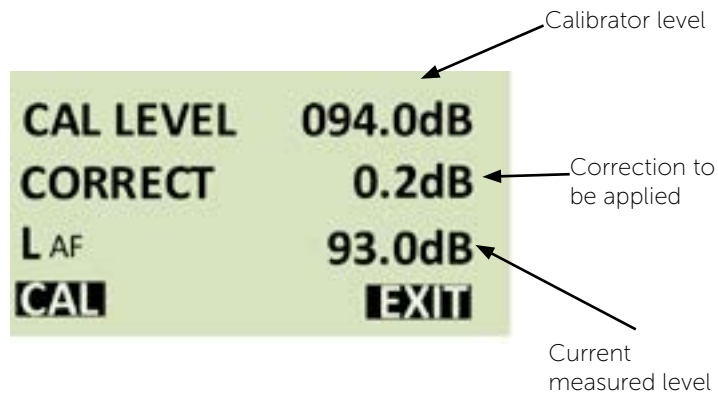
*Printer functionality only available on the CR:310 model.

4. Display interface

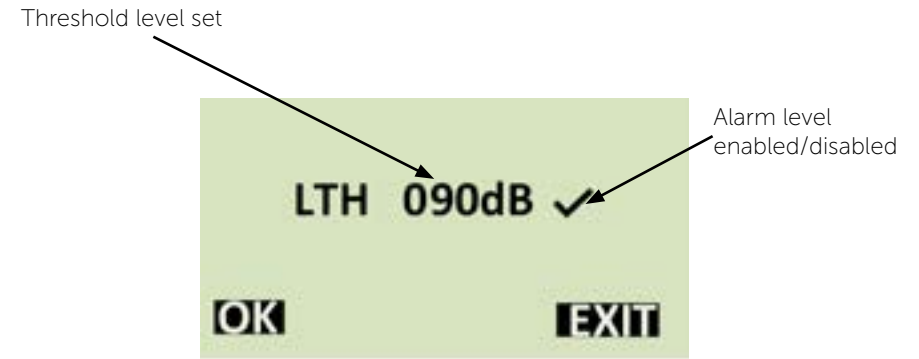
CR:308 & CR:310 main display



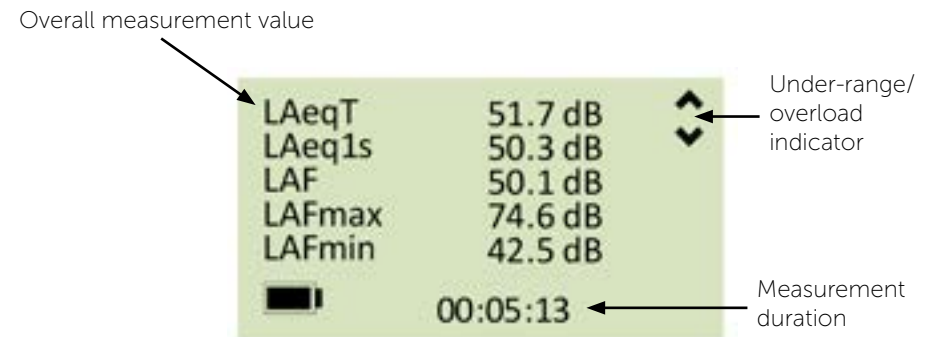
Calibration display (press the CAL button) - see page 14



CR:308 alarm set display (press see page 12)

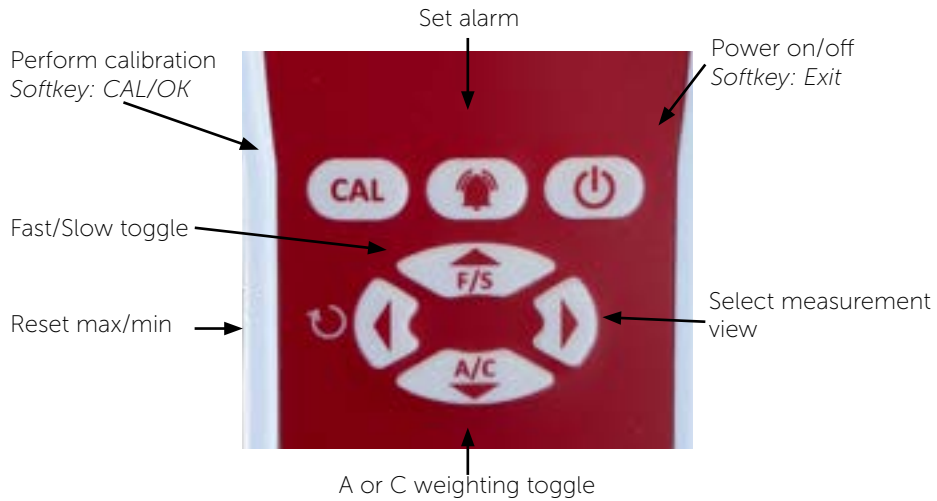


CR:310 measurement display - see page 13



5. Keypad interface

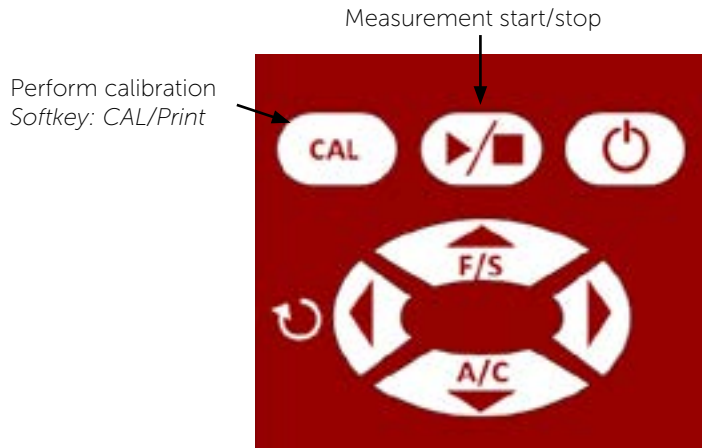
CR:308 keypad



Calibration display (press the CAL button) - see page 14

CR:310 keypad

As per the CR:308 (above) with the following differences.



6. Instrument operation

Fit new batteries by sliding the battery cover open and inserting two AA batteries in the correct orientation.

Switch on and allow the instrument to settle for 60 seconds before calibrating.

Before starting a measurement, calibrate the instrument as per the guidance in Chapter 7 of this handbook.

6.1 Selecting the frequency and time weighting

Select the measurement frequency and time weighting required:

To toggle between A and C weighting, press 

To toggle between fast and slow weighting, press 

The measurement type is displayed in the main window:

- LAF - A frequency weighting and fast time weighting
- LCF - C frequency weighting and fast time weighting
- LAS - A frequency weighting and slow time weighting
- LCS - C frequency weighting and slow time weighting


To toggle the measurement values, press . This will toggle through the following measurement values if the meter is set to LAF:

LAF > LAFMax > LAFMin > LCpk > LAF

Integrating averaging measurements Lxeq1s and Lxeq8h are available for measurements on the CR:310 instrument.

6.2 Maximum, minimum and LCpk values

Maximum, minimum and LCpk values are shown for the duration of time since the meter was switched on, or since the reset button was last pressed.



These values can be reset by pressing 

6.3 Setting the level alarm (CR:308)

The level alarm function can be used to trigger an alert if the noise level exceeds a predetermined value, which is set by you.

To set the alarm level, press  to enter the alarm set up display.



Set the desired level using the arrow buttons and enable the alarm using the arrow buttons to select the tick (a cross denotes that the level alarm is disabled).  in set, press  (OK).


NB: the alarm level must be set to less than 129dB.

With the alarm level enabled, the main display will show if the level has been exceeded by showing an Asterix (*) next to the sound level reading. The triggered threshold limit

can be reset by pressing .

NB: this will also reset the maximum, minimum and LCpk measurement.

6.4 Performing and printing a measurement (CR:310)


Press  to start or stop a measurement. Whilst a measurement is running, the latest values will be displayed on the screen, with the measurement duration shown at the bottom. Alternative measurement parameters can be viewed by pressing the up/down arrow buttons.



Overload and under-range are denoted by the ^ and v indicators in the top right corner of the screen.

After stopping a measurement, the overall measurement values are displayed. Press the up/down arrows to scroll through the overall measurement values.




If a printer is attached, the results can be printed by pressing  (Print).

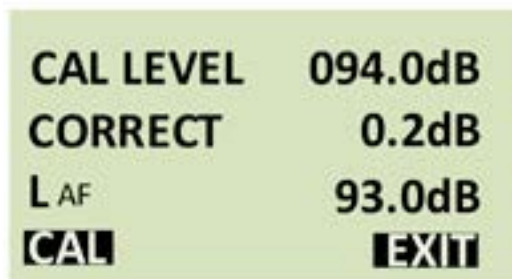
The measurement view can be cancelled by pressing  (Exit).

7 Calibrating the meter

Before making a measurement, it is important that you calibrate your instrument with an acoustic calibrator, such as the Cirrus Research CR:514 1kHz 94dB calibrator.

To start the process of calibration, ensure the microphone is fitted correctly and place the acoustic calibrator over the microphone.

Press  to enter the calibration menu.



Use the arrow keys to set the CAL LEVEL to the acoustic calibration level (94.0dB for the CR:514 calibrator).

Use the arrow keys to set the CORRECT value to 0.2dB, which will make the adjustment for the gap between the calibrator and the microphone (pressure field of the acoustic calibrator and the free field of the instrument and microphone) (for HY205 microphone). This will result in the meter reading 93.8dB when a 94dB calibrator is used.

Switch on the acoustic calibrator and press  to automatically calibrate the meter.

Press  to exit from the calibration display and to return back to the main display.

8 Specification and technical information

Standards:	IEC 61672-1:2013 Class 2
Measurement range:	30dB (A)~130dB (A) 40dB (C)~130dB (C)
Frequency weighting:	A and C
Time weighting:	Fast (F) and Slow (S)
Display functions:	Normal, Maximum, Minimum, C peak
Measurement functions:	LAF, LAS, LCF, LCS, LCpk
Noise floor	< 25dB (A) and 35dB (C)
Display flags:	Alarm Limit, Overload, Under-range
Auto calibration range:	±4.5dB
Reference point:	94dB (1kHz), 92.9dB (8kHz)
Settling time:	60s
Display:	Backlit 128x64 LCD
Resolution:	0.1dB
Electrical inputs:	5V power in via mini USB
Power:	2 x AA/LR6 1.5V batteries or 5V DC via Mini USB input
Battery life:	24 hours with alkaline batteries
Microphone:	½" pre-polarised electret condenser type HY:205
Operating temperature:	0°C to +40°C
Operating humidity:	25%~90%
Atmospheric pressure:	65kPa~108kPa

Storage Temperature:	-20°C to +60°C
Dimensions:	215mmx68mmx32 mm
Weight:	220g (including battery)
Electrical Outputs:	AC (tip 3.5mm jack) and DC (middle 3.5mm jack)
DC Output:	voltage 15mV/dB, range 450mV~1950mV
AC Output:	RMS 2V

9 Reference Information for Periodic Testing

Reference level (1kHz)	94dB
Reference level (8kHz)	92.9dB (A)
Linear range 8kHz	30-130dB
Linear range 4kHz	30-130dB
Linear range 1kHz	30-130dB
LCPeak maximum (500Hz, 1kHz, 8kHz)	133dB
Self-generated noise floor	A weight = 25dB C weight = 35dB
Self-generated noise floor with mic fitted	A weight = 25dB C weight = 35dB
Dummy microphone capacitance	18pf
Recommended dummy microphone	KP:66

Multifrequency acoustic calibrator correction data (set to pressure and test on A weighting)

Frequency	Correction
125Hz	0.0
1kHz	0.2
8kHz	2.6

Free field correction for HY205 microphone.

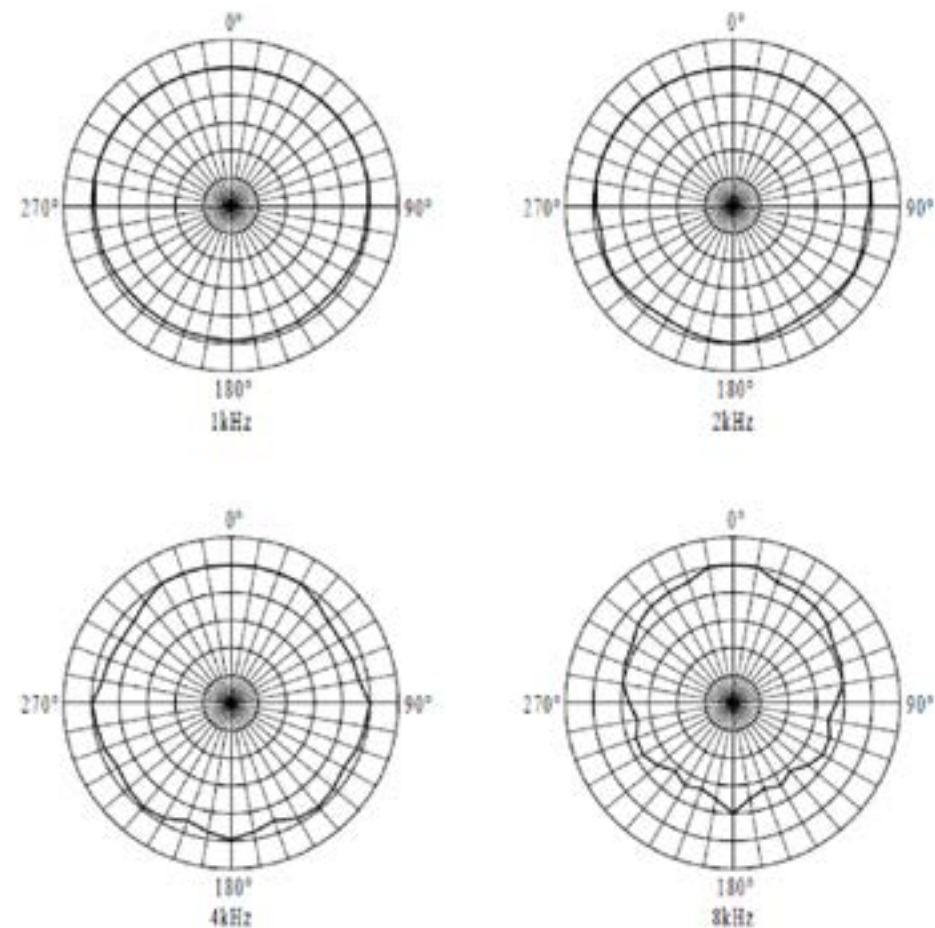
Frequency / kHz	Free field correction / dB	Frequency / kHz	Free field correction / dB
1	0.1	6.3	1.7
1.25	0.1	8	2.6
1.6	0.2	10	4.4
2	0.3	12.5	5.3
2.5	0.5	16	6.5
3.15	0.7	18	7.1
4	1.0	20	7.8
5	1.4	---	---

Case reflection and windshield attenuation data.

Frequency / kHz	Case correction	Windshield correction	Uncertainty
63	0	0	0.27
125	0	0	0.27
250	0.13	0.05	0.27
500	0.18	0.08	0.27
1000	0.09	0.1	0.27
2000	-0.16	0.26	0.27
4000	0.01	0.53	0.32
8000	-0.10	0.26	0.30
16000	-0.17	-0.58	0.29

Add the above data to your measurement to correct.

Directionality plots and case reflection plots



10 Options and accessories

The following table contains information about the model options and accessories available with this sound level meter.

Cirrus part number	Description
CR:308	Basic sound level meter with threshold
CR:310	Basic sound level meter with measurement
PR:310	Thermal printer (for CR:310 only)
CR:514	Acoustic calibrator
CK:380	Kit case (empty)
CK:381	CR:308 kit including case, meter and calibration
CK:382	CR:310 kit including case, meter and calibrator
UA:30X	Spare windshield
CP:65	Carrying pouch (sound level meter and calibrator)

11 Serial connection

DB9, RS232 communication rate at 9600 Baud.

1 bit start, 8 bits data, 1 bit stop, No parity

12 Appendix A - CE Declaration of Conformity

Manufacturer:

Cirrus Research plc
Acoustic House
Bridlington Road, Hunmanby
North Yorkshire
YO14 0PH



Telephone: 01723 891655

Equipment manufactured after June 2018.

Equipment description

CR:308 sound level meter
CR:310 sound level meter

Along with their standard accessories.

According to:

EMC Directive 2014/30/EU
Low Voltage Directive 2014/35/EU

Signed

June 2018

Martin Williams
Director

13 Appendix B - Warranty Information

1. The period of the initial guarantee starts from the date of purchase, as a new instrument, from Cirrus Research plc or their formally approved distributors. The periods are as follows unless otherwise stated by Cirrus Research plc in writing:

Products manufactured by Cirrus Research plc	24 months
Repairs	3 months
Replacement microphone capsules	12 months
Spare parts (excluding replacement microphone capsules)	3 months
Products manufactured by a third party (see clauses 12 & 14 below)	Based on the individual manufacturer's warranty

2. The initial guarantee covers all faults and accidental damage to the product.

3. Warranty extension

If the product is returned to Cirrus Research plc or one of its Authorised Service & Calibration Centres for routine verification & calibration after the initial guarantee period, upon completion of the verification the product will be given an additional free one (1) year warranty.

This must be done with a 6-week window of the anniversary date of shipment. This is limited to 3 weeks either side of the anniversary date of the shipment.

It follows that if an instrument is routinely verified by Cirrus Research plc (or an Authorised Service & Calibration Centre) every year after the initial warranty period, the warranty is effectively continuous to a maximum of fifteen (15) years from the original date of purchase.

There will be a charge for the verification (or calibration) of the equipment.

4. Buying back into the warranty

Where the warranty has expired, the customer can buy back into the warranty scheme. This reactivates the warranty for a further 12 months and provides the same level of cover as for the initial period above.

This must be purchased at the same time as a calibration or verification.

The maximum period of any warranty, whether it had been extended or not, is 15 years from the original purchase date.

This offer can only be redeemed once during the life of the instrument.

5. The initial guarantee, and any extended warranty is not transferrable and is provided to the original customer only.

6. Where a product is returned for routine verification or calibration, the customer is responsible for all transportation, duty and other charges.

7. The user shall be responsible for determining if the product is suitable for the use and that such use complies with any applicable laws, regulations or standards.

8. The customer must notify Cirrus Research plc in writing of any claimed defect in the product immediately upon discovering it.

9. Where an instrument is being returned under the guarantee or warranty, it must be returned to Cirrus Research plc without undue delay at the customer's risk with transportation charges prepaid.

10. Where the product is deemed to be faulty due to manufacturing defects, Cirrus Research plc shall:

- a. Repair or replace the defective products
- b. Be given reasonable time by the customer to make such repairs or replacements
- c. Return the product to the customer at Cirrus Research plc's expense

11. Cirrus Research plc reserves the right to decline an instrument under the initial guarantee or extended warranty where;

- a. The product has continued to be used after defect has been discovered
- b. There is clear evidence of damage or misuse that is deemed to be more than minor accidental damage
- c. The product has been modified or repaired by persons other than those authorised by Cirrus Research plc
- d. The defect arises from the use of the product in conjunction with products or materials not reasonably contemplated by Cirrus Research plc
- e. No fault is found with the product

12. The initial guarantee or extended warranty does not extend to products or materials not supplied by or manufactured by Cirrus Research plc. Consumable items, including dry-cell and alkaline batteries are not covered by the initial guarantee or extended warranty.

13. Where re-chargeable batteries are used as an integral part of the product design and the product is shipped with the batteries installed (for example the doseBadge5 Noise Dosimeter), the standard product guarantee and extended warranty applies provided that the user has used the correct charging instructions and has followed the charging regime stated in the product manual.

14. No warranty is offered for used equipment unless a special arrangement is made and is confirmed in writing by Cirrus Research plc

15. Cirrus Research plc reserves the right to amend or update these terms and conditions without notice.

This warranty does not in any way reduce or affect the legal rights of the buyer and is in addition to any statutory rights.

14 Cirrus Research offices

The addresses given below are the Cirrus Research plc offices. Cirrus Research plc also have approved distributors and agents in many countries worldwide. For details of your local representative, please contact Cirrus Research plc using the information below. Contact details for Cirrus Research authorised distributors and agents are also available from the website at the address shown below.

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