



# Instrument Handbook

•  
CR:514 & CR:515  
Single-Level Acoustic  
Calibrator

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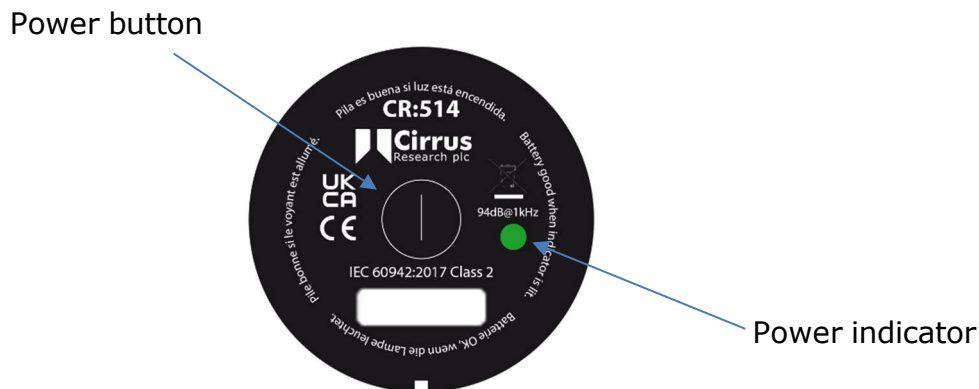
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## Operation

### Switching on the Calibrator

Press the Power button on the end of the Calibrator to switch the unit on. The indicator will illuminate to show that the unit is operating.



The calibrator will automatically switch off after 5 minutes to preserve battery power.

To switch off the calibrator manually, press the power button again and the indicator will extinguish to show that the unit is switched off.

### Permanent-on Mode

For some applications there may be a need to have the calibrator switched on continuously. To allow for this, the calibrator can be turned on by pressing and holding the power button for three seconds.

Release the button and the indicator will flash to show that the unit is in permanent-on mode. Press the power button to switch off the calibrator.

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## **Calibrating a Sound Level Meter**

Push the microphone of the Sound Level Meter into the cavity at the end of the calibrator. Ensure the microphone is fully inserted into the cavity and is past the 'O' ring seals. The microphone should be parallel to the body of the calibrator. Also ensure that the small bleed-hole next to the microphone cavity is not blocked as this could cause damage to the microphone.

Most modern Sound Level Meters have electronic calibration with the level adjusted automatically. Adjust the Sound Level Meter to the correct level where applicable. When correcting the value generated by the calibrator a correction for the type of microphone capsule may need to be applied (see Appendix 2)

## **Background Noise**

In order for the calibrator to operate as intended, the ambient acoustic noise level should be no greater than 80dBA.

## **Stabilisation**

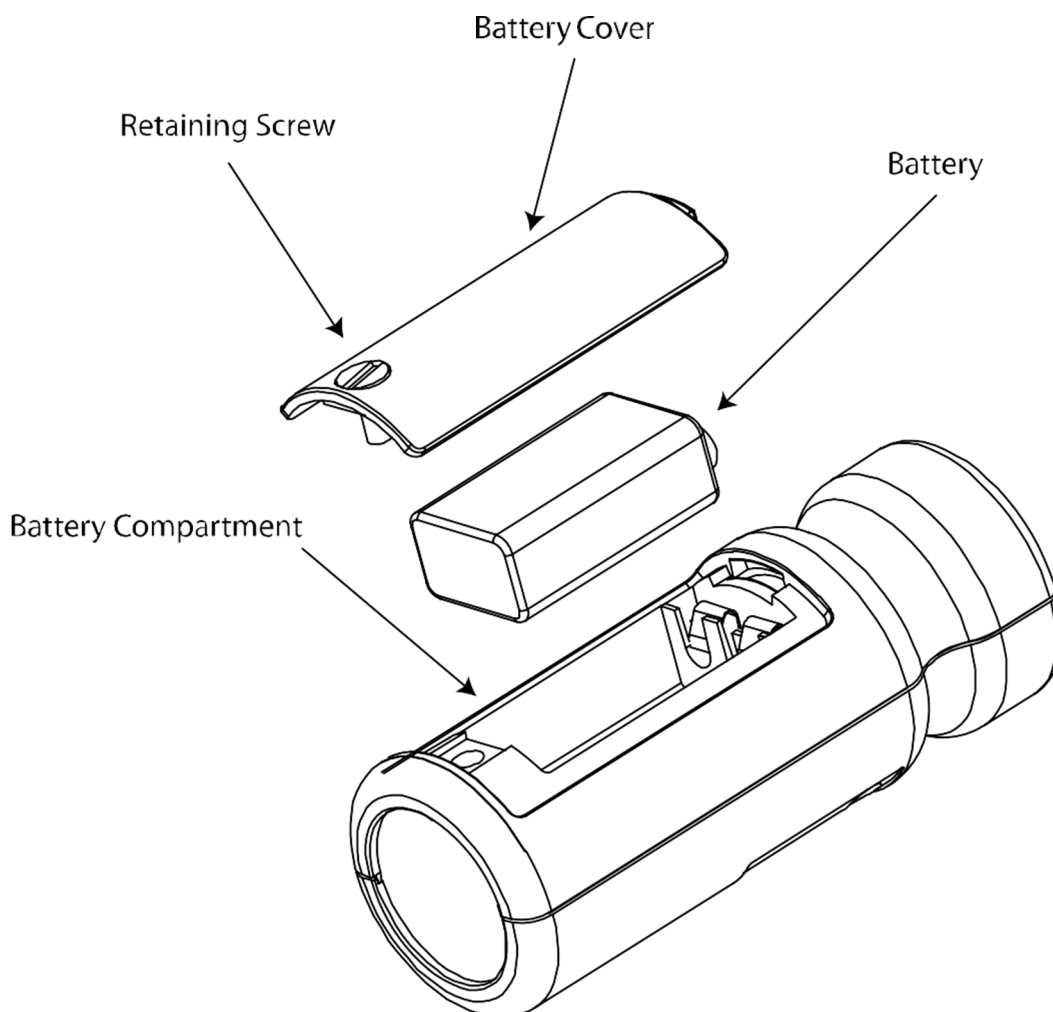
In order for the sound pressure level and frequency to stabilise after switching the calibrator on when coupled to a microphone, a period of at least 5 seconds should be allowed before performing a calibration.

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## Changing the Battery

The CR:514 & CR:515 acoustic calibrators use a single 9v alkaline battery. This type of battery is known as 6F22 or NEDA 1604. It is also commonly known as PP3.

1. Unscrew the screw holding the battery cover on, using a coin.
2. The battery, type 6F22 (PP3) can now be eased out of its holder and replaced. The battery should be eased out terminal side first by pushing against the spring at the other end. Ensure that the battery is inserted with the correct polarity with the negative terminal at the contact with the larger cutout.



### Battery type

The battery should be an alkaline battery, not an ordinary dry cell. The battery is 9 volts when new and will operate the calibrator down to 6.4 volts. When the battery voltage is below 6.6 volts but above 6.4 volts, the power LED will flash to indicate that the battery voltage is low. When the battery voltage is below 6.4 volts the calibrator will not turn on. A discharged battery may allow switch-on but will soon drop in voltage and indicate low battery or switch off.

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## Specification

Frequency	1kHz $\pm$ 1%
Sound Level	94dB re 20 $\mu$ Pa
Standardisation	CR:514 - IEC 60942:2017 Class 2 CR:515 - IEC 60942:2017 Class 1
Distortion	Less than 2%
Operating Humidity	25 to 90% Relative Humidity
Operating Static Pressure	65 kPa to 108kPa
Operating Temperature	-10°C to +50°C
Storing Temperature	-20°C to +60°C
Effective Volume	6.19 cm <sup>3</sup> $\pm$ 0.2 cm <sup>3</sup>
Effective Load Volume Sensitivity	-0.0008 dB/mm <sup>3</sup> @ 1kHz
Cavity Diameter	0.525 inch
Battery	1 x 9v 6F22 (Neda 1604)
Battery Life	Approx 15 Hours Continuous Use
Battery Voltage	9v Nominal (10v Maximum, 6.4v Minimum)
Weight with Battery	185g
Dimensions	120mm x $\varnothing$ 48mm

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## Technical Information

The normal mode of operation of the calibrator is with the unit switched on.

When the LED indicates the unit is switched on this produces the greatest radio frequency emissions.

The calibrator continues to function after exposure to contact discharges up to 4kV and air discharges up to 8kV, for both positive and negative voltages relative to earth ground.

The calibrator conforms to IEC 60942:2017 for a modulated root-mean-square electromagnetic field strength of 10 V/m.

The maximum susceptibility to power and radio frequency fields is with the cavity facing away from the emitter with the battery compartment facing the table, the antenna polarisation horizontal and the calibrator switched on.

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## Free Field Correction

When calibrating a microphone which is to be used for free field measurements, a small correction may be necessary to compensate for the difference between the microphone's free field response at 'zero degrees' or 'head-on' incidence and the pressure level generated by the calibrator.

Calibration corrections are listed below for the Cirrus Research plc 1/2" Capsules and three microphone capsules commonly used in Calibration Laboratories:

### Microphone Correction Values

<i>Microphone Type</i>	<i>Calibration Correction</i>	<i>Effective Calibration Level</i>
<b>MK:216</b>	<b>-0.3dB</b>	<b>93.7 dB</b>
<b>MK:224</b>	<b>-0.3dB</b>	<b>93.7 dB</b>
B&K 4134	0dB	94.0 dB
<b>B&amp;K 4180</b>	<b>0dB</b>	<b>94.0 dB</b>
B&K 4192	0dB	94.0 dB

### Example

An example of the procedure used to calculate the value for an MK:224 microphone is shown below :

Level = 94.0dB + Microphone Correction

Level = 94.0dB + ( -0.3dB)

Level = 93.7dB

Different microphones will have different correction values. Please check the operation manual for the Sound Level Meter or microphone concerned for details.

## EU Declaration of Conformity

Manufacturer:  
Cirrus Research plc  
Acoustic House, Bridlington Road  
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United Kingdom



### Equipment Description

The following equipment manufactured after 1<sup>st</sup> September 2022:

CR:514 Acoustic Calibrator  
CR:515 Acoustic Calibrator

According to:  
EMC Directive 2014/30/EU  
Low Voltage Directive 2014/35/EU  
RoHS Directive 2011/65/EU

meet the following standards

EN61000-6-3:2020  
Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments

EN61000-6-1:2020  
Electromagnetic compatibility (EMC). Generic standards. Immunity for residential, commercial and light-industrial environments

EN 61000-6-2:2019  
Electromagnetic compatibility (EMC) - Generic standards - Immunity standard for industrial environments

Auxiliary Industry Standards  
EN 60942:2017 Sound calibrators

Signed

Dated 20<sup>th</sup> July 2022

A handwritten signature in black ink, appearing to be 'Mark Swale', written over a horizontal line.

Mark Swale  
Chief Engineer

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## Product Guarantee & Extended Warranty

1. Every new product is provided with a 12-month no-quibble warranty. This covers everything we provide against failure, poor workmanship and accidental damage.  
*NB - European Union law states a product has to be fit for purpose for 24 months after purchase. This two-year period covers failure and poor workmanship only.*
  2. If the product is calibrated by Cirrus Research or an authorised calibration and service centre, then the initial 12-month warranty is extended by a further 12 months, with the same conditions, for up to 15 years in total.
  3. If a product has not been calibrated annually by Cirrus Research or an authorised calibration and service centre, then you may buy back into the warranty scheme for a small fee, plus the cost of calibration. This can only be done once during the life of the product.
  4. If a microphone capsule fails under warranty and is physically damaged, we will replace it with a refurbished capsule.
  5. If you don't wish to have a refurbished capsule, then you can trade in your damaged capsule for a new one, which will incur a fee.
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## **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 at the address below. Contact details for Cirrus Research authorised distributors and agents are also available from the Internet Web site at the address shown below.

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