

The CEL-120 provides a highly stable reference level across changes in all environmental conditions. Corrections for variations in atmospheric pressure are not required.

Both calibrators generate a highly stable sine wave excitation in the acoustic cavity, with low harmonic distortion.

These calibrators offer a nominal pressure calibration level of 114.0 dB at a frequency of 1 kHz. The CEL-120/1 can also supply a calibration level of 94.0 dB at a frequency of 1 kHz.

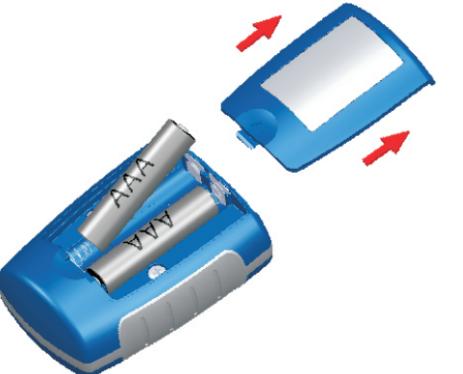
## Schedule of Parts

A complete "Acoustic Calibrator" consists of the following items.

- CEL-120/1 Calibrator (Class 1) or CEL-120/2 Calibrator (Class 2)
- 016022 (2 off) AAA battery (LR03)
- FG40 Field Guide

Optional 1/2"-to-1/4" Microphone Coupler (CEL-4726)

## Preparation for Use



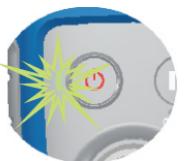
Ensure the battery polarities are correct. Replace the cover after battery installation.  
The calibrator is now ready for use.

## LEDs

### Green LED - Power indicator



Green LED On  
The calibrator is switched on and is operating normally.



Green LED Flashing  
Battery level is low (< 1.75 V)  
Replace the batteries.

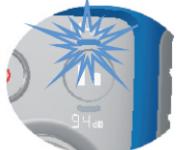
For the most reliable operation with longest life, the use of an alkaline battery is recommended. Rechargeable batteries may also be used.

It is recommended to remove the batteries if the calibrator is to be out of service for long periods.

### Upper Blue LED - 114 dB level indicator



Upper Blue LED On  
The calibrator is set to 114 dB and the level is stable.



Upper Blue LED Flashing  
The level is not stable.

If a microphone is not inserted, or if it is not fully inserted, the Blue LED will continue to flash and the calibrator will not be able to maintain control. When this condition persists for 10 seconds, the calibrator automatically switches off.

After a stable calibration signal has been achieved, the Blue LED will stop flashing and will remain on.

#### CEL-120/1 only:

On the CEL-120/1 only, select the required calibration level.

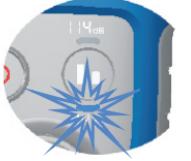
In noisy environments the 114.0 dB level should be used. As a general rule, try to

calibrate using a level at least 20 dB higher than the background noise level.

### Lower Blue LED - 94 dB level indicator



Lower Blue LED On  
The calibrator is set to 94 dB and the level is stable.



Lower Blue LED Flashing  
The level is not stable.

## Timeout

1. The calibrator will switch off after 1 minute or 10 seconds after the microphone is removed.
2. If the calibrator is unstable (there is no microphone inserted), it will switch off after 10 seconds.
3. If a longer calibration period is required, when you switch the calibrator **On**, hold the On/Off button until both Blue LEDs come on, and then release the On/Off button. The calibration signal will now be continuous regardless of whether the calibrator is stable or not.



## Operation

### Field Accuracy Check (Acoustic Calibration)

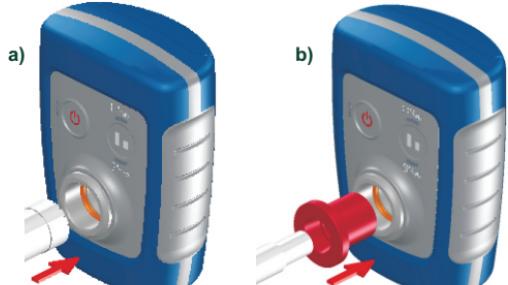
Follow the instructions below to perform a field accuracy check (acoustic calibration) with the CEL-120/1 or CEL-120/2 immediately before and after measurements are made with a sound level meter or a sound measuring system.

**Caution** – Make sure the microphone and the calibrator (plus the coupler when used) are correctly aligned during insertion because the microphone could be damaged if not inserted squarely, or if inserted at speed or if excessive force is used.

1. Carefully insert either:-

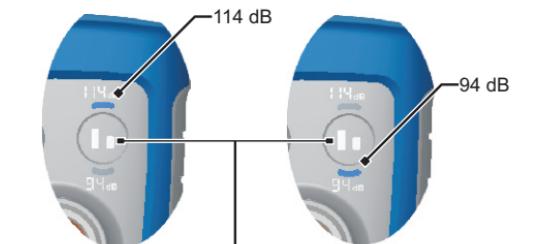
- a) WS2 (half-inch) microphone up to the stop within the calibrator cavity.
- Or
- b) CEL-4726 Coupler up to the stop within the calibrator cavity and then carefully insert the WS3 (quarter-inch) microphone up to the stop within the cavity of the coupler.

Note that the coupler flange does not fit flush against the calibrator rim.



2. Press the **On/Off** button to switch the calibrator on.

Refer to the measuring instrument's handbook and select a suitable measuring range and frequency weighting for the calibration.



3. Press the **Level toggle** button to toggle between the 114.0 dB and 94.0 dB levels (this feature is available only on the CEL-120/1).

If necessary, adjust the calibration control of the measuring instrument until it

shows the correct indication (114.0 dB or 94.0 dB).

4. Wait 3 seconds for the output to stabilise.
5. After use press the **On/Off** button to switch the calibrator off.
6. Remove the microphone and any coupler from the calibrator.

The calibrator will also automatically switch itself off after 10 seconds when the microphone is removed.



## Product Care

CEL-120 Calibrators are precision instruments and should be treated with care.

### Avoid:

- Physical shocks or drops
- Ingress of dirt, dust and other foreign objects into the sound cavity
- Exposure to water droplets or condensation

## Compliance

The CEL-120/1 and CEL-120/2 Acoustic Calibrators comply with the EMC Directive 2004/108/EC of the European Union. They have been tested according to the standard delivery schedule and comply with the following standards:

- EN 61000-4-2:2009 Testing and measuring techniques – electrostatic discharge immunity tests
- EN 61000-4-3:2010 Electromagnetic field immunity tests
- EN 61000-6-3:2011 Emission standard for residential, commercial and light industrial environments

## Field Guide

### CEL-120/1 and CEL-120/2

#### Acoustic Calibrators



## Specification

### Type:

- CEL-120/1: Calibrator to EN (IEC) 60942: 2003 Class 1
- CEL-120/2: Calibrator to EN (IEC) 60942: 2003 Class 2
- Both calibrators meet ANSI S1.40-2006
- Calibration reference condition: 23 °C, 101.3 kPa and 50 %RH.

### Reference Microphone:

- B & K4133, Nominal load volume: 190 mm<sup>2</sup>

### Calibration level: (at reference conditions)

- CEL-120/1: 114.0 dB ± 0.25 dB and 94.0 dB ± 0.25 dB,
- CEL-120/2: 114.0 dB ± 0.35 dB.
- Calibration frequency: 1 kHz ± 5 Hz.
- Stabilising time: 5 s
- Sensitivity to load volume change: 0.0002 dB/mm<sup>2</sup>

### Short term level stability:

- < ±0.1 dB for CEL-120/1
- < ±0.2 dB for CEL-120/2
- Total harmonic distortion: Less than 1%.

### Tolerance limits for the CEL-120/1 (Class 1) over full environmental conditions:

- Static pressure range: 650 to 1080 mBar
- Air temperature range: -10 to +50 °C
- Relative humidity range: 25 to 90 % RH
- Pressure coefficient: <0.004 dB/kPa
- Better than <±0.4 dB deviation over environmental ranges

### Tolerance limits for the CEL-120/2 (Class 2) over full environmental conditions:

- Static pressure range: 650 to 1080 mBar
- Air temperature range: -10 to +50 °C
- Relative humidity range: 25 to 90 % RH
- Pressure coefficient: <0.004 dB/kPa

- Better than <±0.6 dB deviation over the environmental range
- Storage temperature range: -20 to +60 °C.
- Battery: 2 × 1.5 V, AAA (LR03).
- An alkaline battery is recommended and typically provides 2 minutes of operation per day for almost 2 years.
- Dimensions: 75.5 mm × 54.0 mm × 37.0 mm (2.9 × 2.1 × 1.4 in).
- Weight (including batteries): 85 g (0.19 lb).

## Manufacturers Servicing and Warranty Arrangements

In order to ensure its rigid conformity with the requirements of the specification, this instrument is thoroughly inspected and calibrated prior to dispatch from the factory. All technical information for an individual instrument is filed under the instrument serial number. Therefore, the instrument serial number should be quoted in any correspondence concerning the instrument.

The manufacturers undertake to rectify any defect in the instrument that is directly attributable to faulty design or assembly, and which becomes apparent during the warranty period. In order to take advantage of this warranty, the instrument must be returned, carriage paid, to the manufacturer's factory or accredited agent, where necessary repairs will be carried out.

Normally, the warranty period runs for 24 months from the date of receipt of goods, with exceptions on certain specialised components supplied by other manufacturers which are warranted for shorter periods. Some of the specialised components used in this instrument may be subject to longer guarantees by their actual manufacturers and in all such cases the benefits of these undertakings will be passed on to the user. However, Casella CEL's liability is limited to items of their own manufacture, and they do not accept liability for any loss resulting from the operation or interpretation of the results from this equipment.

A comprehensive Instrument Calibration Maintenance Agreement (ICMA) scheme is available to extend the initial warranty period of this instrument. At the end of the first warranty period, it is recommended that the equipment be returned to the Service and Re-calibration Department at Bedford, where it will be inspected and entered into the ICMA scheme as required. The warranty will then be extended for the period stated on the individual schedule. Please contact your local Casella CEL agent for full details of this service.

In the event of a malfunction developing during the warranty period, the instrument should be carefully packed and returned either to Casella CEL's local agent, or in the case of domestic sales, to the Service Department at Bedford.

Please include the following information:

- Instrument type(s) and serial number(s)
- Customer name and address
- Contact name and phone number
- Reason for returning the equipment, with a detailed description of the fault

The necessary adjustments or repairs will be carried out, and the instrument returned as soon as possible. After the warranty has expired (except on approved accounts) service work is undertaken against quotations, and all packing and transit costs are charged extra.

## Introduction

The CEL-120/1 and CEL-120/2 Acoustic Calibrators provide an accurate and easily used means of calibrating sound level meters, both in the laboratory and in the field.

- The CEL-120/1 satisfies the requirements of EN (IEC) 60942:2003 Class 1 at user-selected calibration levels of 94.0 dB and 114.0 dB.
- The CEL-120/2 satisfies the Class 2 standard at 114.0 dB.

In addition, both instruments meet the requirements of ANSI S1.40 - 2006.

These calibrators are intended for use with industry standard WS2 (half-inch) microphones, and may also be used to calibrate WS3 (quarter-inch) microphones by means of the CEL-4726 Coupler.