



Model 887-2 Sound Level Calibrator OPERATOR'S MANUAL



About this Manual

To the best of our knowledge and at the time written, the information contained in this document is technically correct and the procedures accurate and adequate to operate this instrument in compliance with its original advertised specifications.

Notes and Safety Information

This Operator's Manual contains warning symbols which alert the user to check for hazardous conditions. These appear throughout this manual where applicable, and are defined below. To ensure the safety of operating performance of this instrument, these instructions must be adhered to.



Warning, refer to accompanying documents.



Caution, risk of electric shock.



This instrument is designed to prevent accidental shock to the operator when properly used. However, no engineering design can render safe an instrument which is used carelessly. Therefore, this manual must be read carefully and completely before making any measurements. Failure to follow directions can result in a serious or fatal accident.

Warranty and Returns

SIMPSON ELECTRIC COMPANY warrants each instrument and other articles manufactured by it to be free from defects in material and workmanship under normal use and service, its obligation under this warranty being limited to making good at its factory or other article of equipment which shall within one (1) year after delivery of such instrument or other article of equipment to the original purchaser be returned intact to it, or to one of its authorized service centers, with transportation charges prepaid, and which its examination shall disclose to its satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on its part, and SIMPSON ELECTRIC COMPANY neither assumes nor authorizes any other persons to assume for it any other liability in connection with the sales of its products.

This warranty shall not apply to any instrument or other article of equipment which shall have been repaired or altered outside the SIMPSON ELECTRIC COMPANY factory or authorized service centers, nor which has been subject to misuse, negligence or accident, incorrect wiring by others, or installation or use not in accord with instructions furnished by the manufacturer.

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1. INTRODUCTION



Never place the operating calibrator tightly against the ear. The high sound level present could be harmful, especially to someone with a hearing deficiency.

1.1 General Description

The Simpson 887-2 Sound Level Calibrator (hereafter referred to as the 887-2, or simply the Instrument) is an accurate, portable sound source designed specifically for convenient field calibration of the Simpson 897 Noise Dosimeter (hereafter referred to as the Noise Dosimeter). Its compact, rugged construction and battery-powered operation permit its use in virtually any location. When acoustically coupled to a Noise Dosimeter, the 887-2 provides a constant, calibrated, sound pressure level of 114 dB or 94 dB (0 dB reference is 20 μ Pascals) at the microphone of the Noise Dosimeter. The sound pressure accuracy is ± 0.5 dB at 23°C and 760 mmHg. The sound frequency is 1,000 Hz. The case of the Instrument is constructed of aluminum and designed to minimize loss when coupling the transducer cavity to the noise Dosimeter microphone.

1.2 Items And Accessories

All items and accessories required for the operation of the 887-2 are furnished with each instrument, and listed in the following table.

Table 1-1. Items and Accessories Furnished With This Instrument

Quantity	Description	Part Number
1	Screwdriver	5-116470
1	9V battery, NEDA 1604	5-114907 *
1	Operator's Manual	6-115263
* Available from local retail stores		

1.3 Technical Data

Table 1-2 lists the technical specifications for the Simpson 887-2 Sound Level Calibrator.

Table 1-2. Technical Data

1. Acoustic Output Frequency Sound Pressure Level	1000 Hz $\pm 1\%$ 114 dB or 94 dB (switch selectable) (Reference: 0 dB = 20 μ Pascals)
2. Accuracy	± 0.5 dB at reference conditions
3. Distortion	Less than 2%
4. Temperature Range	0° to +50°C (operating) -40° to 60°C (storage, battery removed)
5. Output Temperature Coefficient	Less than ± 0.05 dB/°C

6. Operating Relative Humidity:	0 to 90%
7. Power Requirements:	One 9V battery, NEDA 1604
8. Battery Life:	Approximately 100 hours for 2 hours per day operation.
9. Reference Conditions:	23°C, 760 mmHg, 30% to 60% Relative Humidity.
10. Mechanical Construction:	Aluminum case includes acoustic cavity and provides shielding. Electronic circuits are packaged on a single printed circuit board.
11. Weight:	13.5 oz (0.35 kg)
12. Dimensions:	5-1/4" long, 2" diameter (131 mm long, 50 mm diameter)

2. PREPARATION FOR USE

This section contains information and instructions for the packaging and shipping of the 887-2. Included are unpacking and inspection procedures, warranty, shipping, and power requirements.

2.1 Unpacking And Inspection

Examine the shipping carton for obvious signs of damage. If shipping carton is in good condition, inspect the Instrument for possible damage incurred during shipment. If damaged, notify the carrier and supplier and do not attempt further use of the Instrument. If the Instrument appears to be in good condition, read Operator's Manual in its entirety. Become familiar with the Instrument as instructed in the manual, then proceed to check the electrical performance as soon as possible. Also, check that all items listed in Table 1-1 are included with the Instrument.

2.2 Warranty

The Simpson Electric warranty policy is printed on the inside front cover of this manual. Read it carefully before requesting a warranty repair. For assistance of any kind, including help with the Instrument under warranty, contact the factory. Give full details of the difficulty and include the Instrument model number, serial number and date of purchase. Service data or shipping instructions will be sent to you promptly. If an estimate of charges for non-warranty or other service work is required, a maximum charge estimate will be quoted. This charge will not be exceeded without your prior approval.

2.3 Shipping

Pack the Instrument carefully and ship it prepaid to the proper destination. Insure the Instrument.

2.4 Power Requirements

The 887-2 is powered by one 9V battery (supplied). Refer to Table 1-2, items 7 and 8, for description and paragraph 4.2 for replacement. The battery is packaged separately.

2.5 Care Of The Instrument

- a. Immediately clean any spilled materials from the Instrument and wipe dry. If spillage is corrosive, use a suitable cleaner to remove it and to neutralize corrosive action.
- b. Remember to turn off the Instrument when not using it.
- c. Avoid prolonged exposure or usage in areas subject to temperature and humidity extremes, vibration, mechanical shock, dust, corrosive fumes, and strong electrostatic and electromagnetic interference.
- d. Be sure the transducer cap is firmly in place.
- e. If the Instrument has not been used for 30 days, check battery for leakage, and replace if necessary.
- f. It is recommended that the Instrument be returned to the factory annually (sooner if required) for a complete overall check, adjustment, and calibration.
- g. When the Instrument is not in use, store it in a room free from temperature extremes, dust, corrosive fumes, mechanical vibration, or shock. If storage time is expected to exceed 30 days, remove the battery.

3. OPERATION

This section contains the necessary instructions required for operating the 887-2.

3.1 Precautions

The 887-2 is intended for use in conjunction with the Simpson Noise Dosimeters.



When the 887-2 is turned on, a 1000 Hz tone is audible. Under this condition, there is a natural tendency to bring the Instrument against the ear. However, **never** place the operating calibrator tightly against the ear. **The high sound level present could be harmful, especially to someone with a hearing deficiency.**

Carefully review and become thoroughly familiar with the contents of the Operator's Manual for the Noise Dosimeter (precautions, operating notes, specifications, etc.).

Check the calibration of the 887-2 periodically or whenever accuracy is doubted. For example, inspect the Instrument for evidence that might indicate that it has been subjected to severe mechanical shock or environmental extremes. This check can be made by comparison with another 887-2 Calibrator, or with a reference Noise Dosimeter known to be accurate. If another 887-2 or reference Noise Dosimeter is not available, return the Instrument to the factory for a complete overall check.

Be sure the sealing ring in the transducer cap is not damaged and that the leak-to-atmosphere hole is not clogged. (Refer to Table 3-1, item 4.)

3.2 Operational Features And Items

All features and items used to operate the 887-2 calibrator are described in Table 3-1 and illustrated in Figure 3-1.

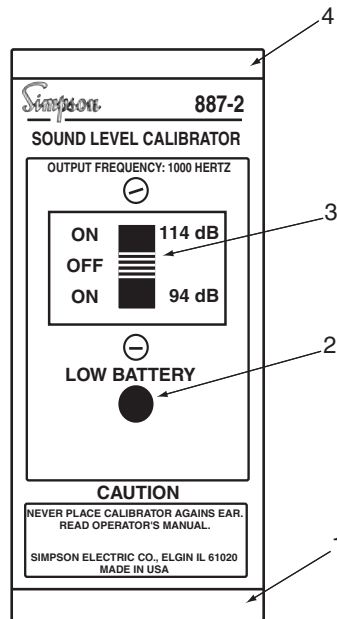


Figure 3-1. Model 887-2

Table 3-1. Operational Features and Items

- | | |
|---|--|
| 1. Battery Cap: | This is an aluminum cap which screws into one end of the Instrument housing. It provides easy access to the battery compartment and also holds the battery firmly in position. |
| 2. Lo Batt Indicator (LED): | A small light-emitting diode (LED) indicator will light if the battery needs to be replaced. The Instrument will automatically shut-down if the battery condition is not adequate to provide the specified sound level pressure. |
| 3. OFF/ON (94 or 114 dB select switch) | This 3-position slide switch is used to turn the Instrument on and select either 94 or 114 dB sound pressure output levels. |
| 4. Transducer Cap: | This is a precisely machined cap which screws into the other end of the housing. The mating of the transducer cap and the microphone of the Sound Level Meter being calibrated constitutes an acoustic coupler. The cap includes a sealing ring to ensure a closed cavity between the cap and Sound Level Meter microphone. A small hole provides a controlled leak to the atmosphere. This cap must be tight when using the calibrator. The accuracy of the calibration is questionable if the transducer cap is loose. |

3.3 Effects Of Atmospheric Pressure And Temperature

For any one location, the effects of normal variations of atmospheric pressure are usually negligible. The effect of elevation is shown in Figure 3-2. This graph shows the change in Instrument output level compared to that obtained at sea level. For example, if the Instrument is being used at 7500 feet, calibrate the Noise Dosimeter for an indication of 113.5 for the 897 Dosimeter.

The effects of temperature are less than ± 0.05 dB/ $^{\circ}$ C (reference is 23 $^{\circ}$ C).

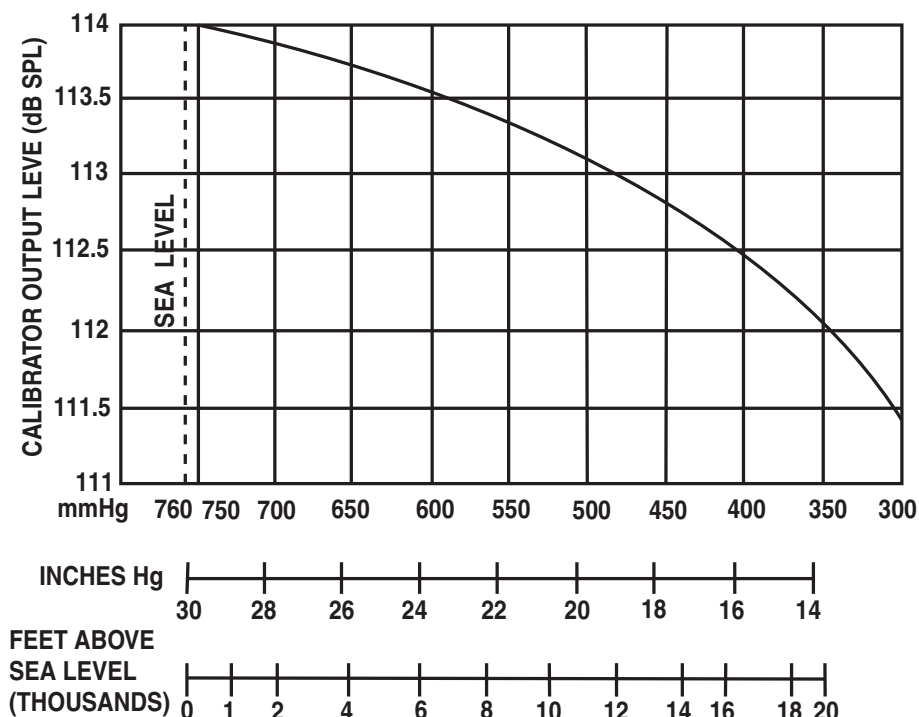


Figure 3-2. Effect of Elevation Upon Calibrator Output

3.4 Calibration Of The 897 Noise Dosimeter

To calibrate the 897 Noise Dosimeter using an 887-2 calibrator:

- If using the windscreen, remove and carefully insert the microphone **fully** into the acoustic cavity of the calibrator (Figure 3-3).
- Set the calibrator power switch to the "ON" position (Figure 3-3) and check that the calibrator battery is okay. (Refer to paragraph 4.1.)

NOTE: It is normal for the sound level of this Instrument to take a few seconds to "ramp up" to the specified output level after it is first switched on. The LO-BATTERY indicator may blink briefly during this time.

- Set the "OFF-RUN-HOLD" slide switch in the 897 to the "RUN" position. Wait until the Display Test sequence is completed, then depress the SPL (CAL) switch (Figure 3-3).
- Select the desired range. For checking at 94 dB use the 50/100 range; for checking at 114 dB use the 80/130 range.

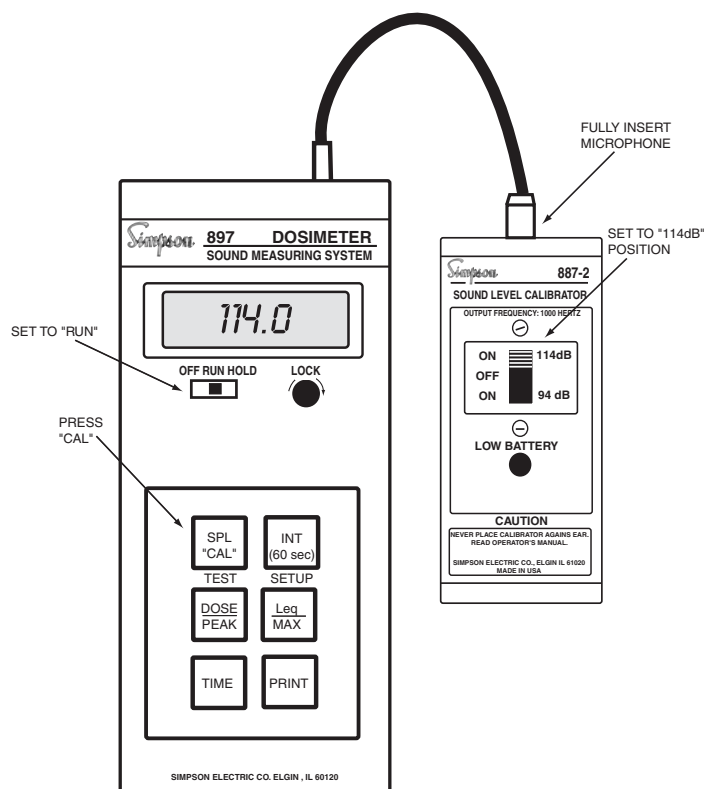


Figure 3-3. 897 Dosimeter Calibration

- e. If calibration is required, using the screwdriver supplied with the calibrator, turn the adjustment control until a reading of either 94.0 dB or 114.0 dB is indicated on the display.
- f. (Optional) The time and date of this calibration may be recorded in the memory of the 897 by pressing and holding the “SPL (CAL)” switch until the display flashes “CAL”. Only the two most recent dates will be stored in the memory of the 897.
- g. Turn off the calibrator. Remove the microphone and replace the windscreen.

4. SERVICING INSTRUCTIONS

The 887-2 contains no operator-serviceable parts, except for the battery. This section contains instructions for replacing the battery. Special training and facilities are required for servicing and calibrating sound level calibrators. Whenever the Instrument does not appear to be functioning properly, send it to the factory.

4.1 Lo-Battery Indication

The Instrument will function according to specifications for approximately eight hours after the time the LO-BATTERY indicator initially lights up; after which time, a “dead battery” detection circuit will automatically shut down the Instrument. The LO-BATTERY indicator will remain on and the battery must be replaced to restore the Instrument to normal operation.

4.2 Battery Replacement

To replace the battery:

- a. Turn off the calibrator.
- b. Remove the battery cap (Table 3-1, item 1) by turning it counterclockwise.
- c. Pull battery from the compartment and unsnap the connector. (Note routing of the connector cable with respect to the battery.)
- d. Snap the battery connector onto the mating terminals of the replacement battery. (The connector is polarized so it only can be connected one way.)
- e. Slide the battery into the battery compartment. Turn the battery so the connector is facing outward. Tuck the connector cable neatly under the battery so it will not interfere when the battery cap is replaced.