

TYPE 1 Sound Meter

840015

Instruction Manual

**SPER
SCIENTIFIC**

Environmental Measurement Instruments

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1. INTRODUCTION

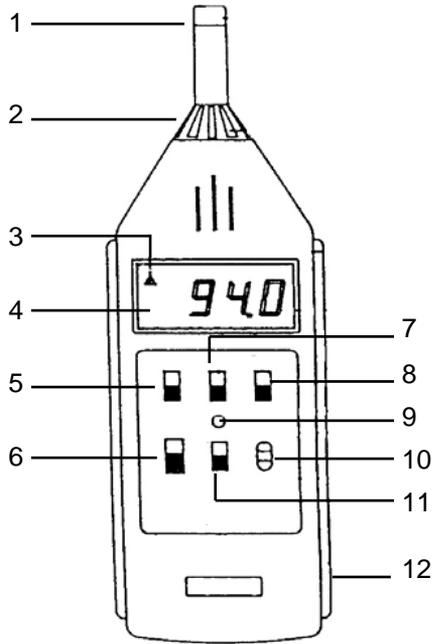
Your new instrument meets IEC61672 and ANSI S1.43 specifications for a Type 1 Sound Meter. It covers the 30 ~ 130 dB range in both the A and C decibel frequency weighting scales, with 0.1 dB resolution and an accuracy of ± 1 dB (63 Hz ~ 4 kHz).

This meter can be acoustically calibrated in compliance with OSHA, using Sper Scientific's Acoustical Calibrator 850016 (or equivalent). Features include a built-in calibration adjustment, easy to read LCD display, fast or slow time weightings, maximum hold function, low battery indicator, AC output and a reset button. CE compliant.

Accessories include a windscreen, calibration tool, a carrying case, instruction manual and batteries.

2. PANEL DESCRIPTION

- 1. Microphone
- 2. Threaded Microphone Cap
- 3. Overload indicator
- 4. Display
- 5. Range selector
- 6. Power/Calibration selector
- 7. Time Weighting selector
- 8. Max Hold/Instant selector
- 9. Calibration Adjustment
- 10. Reset button
- 11. Frequency Weighting selector
- 12. Signal Output Terminal



3. OPERATING INSTRUCTIONS

3-A. Measurement Procedures

- Slide the **POWER** (6) selector to the "I" (on) position.
- For general applications, slide the **MAX HOLD / INSTANT** (8) selector to the INSTANT position.
- To freeze the displayed reading, slide the **MAX HOLD / INSTANT** (8) selector to the MAX HOLD position.
- Press the **RESET** (10) button once to reset maximum hold to the current reading.
- Slide the **FREQUENCY WEIGHTING** (11) selector to the "A" or "C" position. The "A" frequency weighting simulates human ear response. During an environmental sound level measurement, select the "A" weighting. The "C" weighting approximates a flat response. Typically, "C" is used to check the noise of machinery where the target sound level is already known. (See Frequency Weighting Characteristics, page 6.)
- Slide the **TIME WEIGHTING** (7) selector to the "F" (fast) or "S" (slow) position. For general applications, select "F" which simulates the human ear's response time. The "S" setting is used to obtain an average of vibrating sound levels.
- Find the appropriate measuring range using the **RANGE** (5) selector. If the **OVERLOAD INDICATOR** (3) appears in the upper-left display, slide the **RANGE** (5) selector to another setting.
- Point the microphone at the sound source. The sound level will be displayed in decibels (dB).
- When finished, slide the **POWER** (6) selector to the "O" (off) position.

3-B. General Application Settings

- Set **POWER / CALIBRATION** (6) selector to "I" (on).
- Set **TIME WEIGHTING** (7) to "F".
- Set **MAX HOLD / INSTANT** (8) selector to INSTANT.
- Set **FREQUENCY WEIGHTING** (11) to "A".
- Set **RANGE** (5) selector to the appropriate range.

3-C. Signal Output

The 3.5 mm diameter **SIGNAL OUTPUT** (12) terminal may be used to connect the unit to an external device (analyzer, recorder, controller, etc).

3-D. Precautions

- Do not store or operate the unit in high temperatures or in a high humidity environment for long periods.
- Keep the microphone dry and avoid intense vibrations.

4. CALIBRATION

The meter's **CALIBRATION ADJUSTMENT** (9) is located on the front panel. The meter has a built-in internal standard of 94 dB/1 KHz. Use the following procedures to calibrate the instrument before operating for the first time, or when the meter has not been in use for awhile.

Internal Calibration:

- Slide the **POWER** (6) selector to the CAL. Position.
- Slide the **RANGE** (5) selector to the 60 ~ 100 dB position.
- Slide the **TIME WEIGHTING** (7) selector to "F".
- Slide the **FREQUENCY WEIGHTING** (11) selector to "A".
- Use the calibration screw driver to turn the **CALIBRATION ADJUSTMENT** (9) until the display reads 94.0.

External Calibration:

Use Sper Scientifics' Acoustical Calibrator 850016 (or equivalent) to calibrate the unit, including the microphone, in compliance with OSHA.

- Slide **POWER** (6) selector to the "I" (on).
- Turn on the acoustical calibrator and place it onto the Sound Level Meter's **MICROPHONE** (1).
- Slide the **RANGE** (5) selector to the 60 ~ 100 dB position.
- Slide the **TIME WEIGHTING** (7) selector to "F".
- Slide the **FREQUENCY WEIGHTING** (11) selector to "A".
- Use the calibration screw driver to turn the **CALIBRATION ADJUSTMENT** (9) until the display reads 94.0.

5. BATTERY REPLACEMENT

Replace the batteries when "BAT" is displayed. Accurate measurements may be made for several hours after the low battery indicator appears. Replace the batteries with 2 new heavy duty 9V batteries.

6. FREQUENCY WEIGHTING (A and C) CHARACTERISTICS

Frequency	A Weighting	C Weighting	Tolerance (IEC 61672 Class 1)	Tolerance (ANSI S1.43 Type 1)
31.5 Hz	-39.4 dB	-3 dB	± 2.0 dB	± 1.5 dB
63 Hz	-26.2 dB	-0.8 dB	± 1.5 dB	± 1.0 dB
125 Hz	-16.1 dB	-0.2 dB	± 1.5 dB	± 1.0 dB
250 Hz	-8.6 dB	0 dB	± 1.4 dB	± 1.0 dB
500 Hz	-3.2 dB	0 dB	± 1.4 dB	± 1.0 dB
1 kHz	0 dB	0 dB	± 1.1 dB	± 1.0 dB
2 kHz	+1.2 dB	-0.2 dB	± 1.6 dB	± 1.0 dB
4 kHz	+1 dB	-0.8 dB	± 1.6 dB	± 1.0 dB
8 kHz	-1.1 dB	-3 dB	+2.1 dB -3.1 dB	+1.5 dB -6.0 dB
12.5 kHz	-4.3 dB	-6.2 dB	+3.0 dB -6.0 dB	+3.0 dB -6.0 dB
16 kHz	-6.6 dB	-8.5 dB	+3.5 dB -17.0 dB	+3.0 dB -no limit

7. TIME WEIGHTING (Fast and Slow) CHARACTERISTICS

Time Weighting	Max. response ref. continuous signal	Tolerance (IEC 61672 Type 1)
F (Fast)	-1.0 dB	+ 1.0 db
S (Slow)	-4.1 dB	± 1.0 db
Tested with signal on 1000 Hz/94 dB.		

8. SPECIFICATIONS

Display	18 mm (.0.7") LCD 3¼ digits
Function	dB (A and C Frequency weighting), Time weighting (Fast, Slow), Max. hold, AC Output
Measurement Range	30-70 dB, 60-100 dB, and 90-130 dB 40 dB on each step, with overload indicator
Resolution	0.1 dB
Accuracy (23 ± 5°)	Frequency weighting meets ANSI S1.43 calibration input signal on 94 dB 31.5 Hz ~ 8 kHz), then the accuracy of "A" weighting is specified as: 31.5 Hz - ± 1.5 dB, 63 Hz - ± 1 dB 125 Hz - ± 1 dB, 250 Hz - ± 1 dB 500 Hz - ± 1 dB, 06 kHz - ± 1 dB 2 kHz - ± 1 dB, 4 kHz - ± 1 dB 8 kHz - + 1.5 dB to - 3 dB 12.5 kHz - + 3dB to - 6dB 16 kHz - + 3dB to - No Limit
Frequency	31.5 Hz to 16 kHz
Microphone	1/2" standard size electric condenser microphone. Threaded microphone cap unscrews for microphone replacement.
Time weighting (Fast/Slow)	Fast (F): t = 125 ms Slow (S): t = 1000 ms
Internal Calibration	Built-in internal calibration on front panel. Calibrated via internal 94 dB/1kHz square wave generator
Output Signal	AC 750 mVrms corresponding to each range step
Output Terminal	3.5 mm diameter jack
Operating Environment.	0° ~ 50°C (32° ~ 122°F) and less than 80% RH
Power Supply	DC 9V battery x 2PCs, 0006P, MN1604 (PP3) or equivalent, heavy duty or alkaline type
Power Consumption	Approximately DC 17mA
Weight	1 lb (460g) with battery
Dimension	10½ x 3½ x 1½" (260 x 87 x 36 mm)
Optional Accessories	840091 Wind Screen Replacement 840092 Bench-Top Tripod 840093 Field Tripod 850016 Acoustical Calibrator

9. WARRANTY

Sper Scientific warrants this product against defects in materials and workmanship for a period of five (5) years from the date of purchase, and agrees to repair or replace any defective unit without charge. If your model has since been discontinued, an equivalent Sper Scientific product will be substituted if available. This warranty does not cover probes, batteries or damage resulting from accident, misuse, or abuse of the product. In order to obtain warranty service, ship the unit postage prepaid to:

SPER SCIENTIFIC LTD.
7720 East Redfield, Suite 7
Scottsdale, Arizona 85260
(480) 948-4448

The defective unit must be accompanied by a description of the problem and your return address. Register online at www.sperscientific.com or return your warranty registration card within ten (10) days of purchase.