



INSTRUCTION MANUAL



**SOUND LEVEL CALIBRATOR
MODEL CA-10 & CA-11**

MODEL CA-11
SOUND CALIBRATOR with PRECISION TIMER
Precise Calibration of NOISE DOSIMETERS and
other Sound Measuring Instruments

DESCRIPTION

The Quest CA-11 Sound Calibrator contains a precision solid state timer that is accurate to 0.1% for the calibration of Noise Dosimeters where a reference tone must be sustained for a precise time period.

This unique and versatile laboratory instrument has eight selectable sound pressure ranges from 85dB to 117dB at a frequency of 1000 Hz. The unit may be operated in the "timed mode" or "continuous mode".

The microphone coupler fits a standard 1-1/8 inch microphone, and with adaptors will fit smaller diameter microphones. A 1 inch (15/16 inch) adaptor is furnished with the instruments.

A calibration table for Noise Dosimeters based on the OSHA exposure requirements is located on the back of the Calibrator.

The Precision Timer is push-button actuated and will cause the selected sound level to be on for 68 seconds based on 60 Hz line frequency.

For additional Calibrator information refer to CA-10 description following. The CA-11 Calibrator is the same as the CA-10 except that the CA-10 has no timer system.



CA-11 Sound Level Calibrator

SPECIFICATIONS

Operating Modes: Continuous and precision timed.

Timer: Push-button start, 68.27 sec "on"
time $\pm 0.1\%$ accuracy based on 60
Hz line frequency, digitally clocked
from power line.

All other specifications are identical to the CA-10 specifications.

OPERATION

Please read the OPERATION instructions for the CA-10, then proceed with the following: The CA-11 has a three-position OFF-ON-TIMER switch. In the ON position the dB selected sound level will be on continuously for checking of sound level meters or other sound instruments. In the TIMER position no sound will be emitted until the START button is depressed and released. Depressing the start button resets the timer back to zero. Releasing the button begins a new 68-second time count. Should the start button be pressed during a timed period the timer will be reset back to zero and begin again.



Calibrating a Quest M-6 Sound Integrator

MODEL CA-10
SOUND LEVEL CALIBRATOR

Precise Verification of Sound Measuring Instrument Accuracy

DESCRIPTION

The Quest CA-10 Sound Level Calibrator is a self-contained unit that quickly and precisely verifies the accuracy of microphones and sound measuring instruments. The unit generates a reference sound level at precisely 1000 Hz with eight selectable sound pressure levels: 85, 90, 95, 100, 105, 110, 115 and 117 dB. It is used to check many types of sound instrumentation including microphones, sound level meters and particularly noise exposure devices such as the Quest M-6 Sound Hazard Integrator, where the reference tone must be sustained for a period of time. The CA-10, operated on 117 VAC, requires no batteries, and will furnish the audio signal indefinitely. An electrical output is also provided to calibrate equipment operating on electrical inputs, and provides an accurate undistorted 1000 Hz signal.

The CA-10 consists of a stable 1000 Hz oscillator, voltage dividers for producing the eight sound pressure

levels, amplifier stages, magnetic audio transducer, and a coupler that accepts the standard 1-1/8-inch diameter microphone. A separate adaptor is also provided to accommodate a 15/16-inch diameter microphone. Other adaptors to accommodate smaller microphones can also be used.

The Calibrator uses solid state integrated circuitry that provides accurate and stable performance. The diagram on the next page shows the basic operating sections of the Calibrator. The oscillator section is controlled and stabilized by a regulated power supply and thermistor circuitry. The output section consists of a double amplifier stage with temperature compensation and amplitude control providing the drive signal to the output transducer.

SPECIFICATIONS

ACOUSTIC OUTPUT

Frequency: 1000 Hz \pm 3%

Sound Pressure Levels: Eight selectable levels at
85, 90, 95, 100, 105, 110,
115 and 117 dB, reference
0.0002 dynes/cm².

Accuracy: (23° C, 760 mm Hg): \pm 0.3 dB

Temperature Coefficient: 0 to 0.01 dB/°C max.

Altitude Effects: approximately 0.1 dB decrease
for each 500 feet increase in
altitude from sea level to 6000 ft.
elevation, or comparable
atmospheric pressure change (approx.
every 12 mm of Hg decrease)

ELECTRICAL OUTPUT

Voltage: 2.5 volts RMS \pm 20% behind 1000 ohms

Distortion: 0.5% sine wave

Connection: Standard 1/4 inch phone jack

GENERAL

Power Source: 105-125 Volt, 60 Hz

Operating Temperature: 0° to +50°C

Construction: Aluminum housing

Case Size: 4-5/8 x 4-5/8 x 4-3/4 inches

Weight: 2 lbs. 6 oz.

2. (Skip this step if the microphone of the instrument to be measured is 1-1/8 inch in diameter). Insert the proper sized microphone adapter (rim down) into the Calibrator coupler hole.
3. Set Calibrator ON-OFF switch to ON. A rising, raucous tone may be heard for a few seconds while the oscillator comes up to frequency.
4. Set the Calibrator dB selector to the desired sound pressure level.
5. Carefully and slowly insert the microphone into the Calibrator coupler. Be sure the microphone is down inside the coupler resting on the lower coupler rim.

CAUTION

Rapid insertion or withdrawal of the microphone may damage the microphone or the transducer because of the rapid change in pressure on the diaphragm.

6. If the instrument being calibrated is the Quest M-6 Sound

Hazard Integrator or another noise exposure instrument, proceed as outlined in the M-6 Instruction Manual. If the instrument is a sound level meter, compare the meter reading with the Calibrator output. Adjust the meter as required per instructions in the meter manual.

7. When the adjustments have been made, slowly remove the microphone.
8. Set the ON-OFF switch to OFF.

CALIBRATION

The CA-10 Calibrator was precisely calibrated in the Quest laboratory with special acoustical instrumentation traceable to the U.S. Bureau of Standards. The CA-10 is exceedingly stable but, since it is used to calibrate other equipment, it should be periodically checked with laboratory standards. It is recommended therefore that the Calibrator be returned to the factory at least once each year for recalibration, or whenever there is question about its accuracy.