



CS 2040-BOX

**Valigia di Calibrazione
Acustica**

Acoustic Calibration Set

Rel.1.2ing

CS2040-BOX

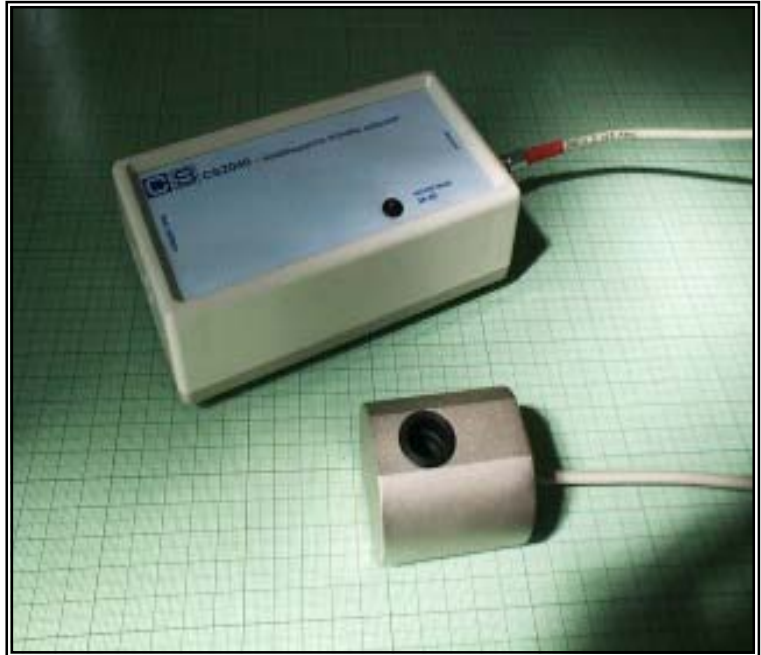
*Calibration Set for
"Test System for Telephonometry -
CS8030" and "Automatic F.F.T.
Telephone Tester – CS8014"*

Calibration set **CS2040-BOX** contains the **Extended range Pressure Calibrator CS2040** and the accessories normally used for acoustic calibration procedures.

This set is especially useful for calibration procedures of Artificial Heads **AC-3** and **AC-4** using the system **CS8030** or **CS8014**, allowing a self-calibration (that is Mouth calibration by means of Ear microphone).

The **CS2040-BOX** contains:

| | |
|---------------|---|
| CS2040 | <i>Acoustic Calibrator</i> |
| X109-2 | <i>8 poles cable</i> |
| AJ-042 | <i>New support for Artificial Mouth calibration</i> |
| AJ-063 | <i>Acoustic impedance for ear cavity verification</i> |
| AJ-064 | <i>Adapter for 1/4" microphones</i> |
| ** | <i>2mm hexagonal key</i> |



microphones, sound level meters and others acoustical devices.

The acoustic test signal can be applied, either directly or by adapters, to microphones having these diameters:

| | |
|----------------------------|-------------------------|
| $13,2 \pm 0,02 \text{ mm}$ | $1/2 \text{ " nominal}$ |
| $7 \pm 0,03 \text{ mm}$ | $1/4 \text{ " nominal}$ |

Connected to **CS8030** or **CS8014**, the Calibrator allows an easy and accurate check either the microphone used inside the Artificial Ears of the Test Head **AC-4** (or **AC-3**) and the Sound Level Meter **PH-18**.

Frequently, the ear couplers, particularly the IEC-R318 or the BRAUN cavities, need a check of its acoustic impedance. That, because the environment dust can obstruct its very narrow annular slit and little holes, changing the acoustical characteristics, and consequently the measurements.

Using the **CS2040** Calibrator together the accessory **AJ-063** let you able to understand if the acoustic impedance is changed out of limits. On this occurrence, the cavity could be sent to the Service for its washing and re-calibration.

The regular use of the Calibrator assures that each acoustical device and the System **CS8030** or **CS8014** are operating within the max accuracy.

CS 2040

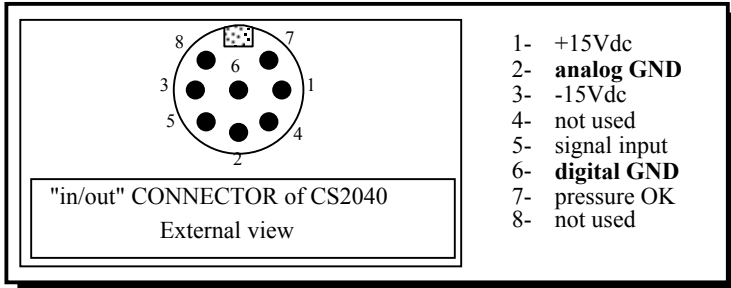
Extended range Pressure Calibrator

1 Introduction

The Extended range Pressure Calibrator **CS2040** generates, into its calibration cavity, stable and accurate sound pressure levels in the frequency range from 100Hz to 8000Hz¹.

The **CS2040** allows the user to check the sensitivity and the response curve of measure

¹ CS8030 or CS8014 supply the pilot signal.



2 Connection

Before start to use the **CS2040** Calibrator you must connect the cable of the acoustic coupler to the control circuit unit. For that, insert the male plug of the acoustic coupler into the "coupler" female connector of **CS2040** unit.

Now you can connect the Calibrator **CS2040** to the **CS8030** or **CS8014** by the cable **X109-2**.

This cable connects the "test system" connector of the **CS2040** to one of connector "din" of **CS8030** or **CS8014**, not already used for others purposes.

Then the system is ready for a calibration procedure.

Remember that:

The Calibrator **CS2040** operates for:

- a frequency range from 100 to 8000Hz;
- different real or equivalent volumes of the microphones under test.
- changes of input pilot signal level.

A red LED lights when the acoustic level into the cavity is correct and stable.

3 Use

CS2040 can be used either connected directly to **CS8030** or **CS8014** or separately. In this last configuration the indicated power supply and the pilot signal must be externally supplied.

Normally the **CS2040** is used with **CS8030** or **CS8014** and here below information about this use are furnished; for different use see data at section 5 - *Characteristics*.

The Calibrator is connected to the **CS8030** or **CS8014** by the cable **X109-2** as indicated at §3.

From **CS8030** "calibration" or **CS8014** "performance verification" menu three procedures are at disposal for calibration and checking of the Ear of Artificial Head **AC-4** or **AC-3**.

A further procedure allows the calibration and checking of Sound Level Meters.

Acoustic Calibration

sensitivity procedure allowing calibration and checking of sensitivity at 1KHz for microphones used in acoustic measurements. Use adapters **AJ-064** for 1/4" microphones.

linearization procedure allowing the linearization of the frequency response, in the range 100Hz to 8000Hz (or 200÷4000Hz), for microphones used in acoustic measurements. Use adapters **AJ-064** for 1/4" microphones. The procedure allows to printout the frequency response of the microphone under test.

Ear check procedure allowing checking, with proper masks, the correct values of the acoustic impedance of Artificial Ears, especially for the **AJ-034** (IEC-R318) and **AJ-036** (BRAUN) cavities. Use the acoustic impedance **AJ-063** fitted into the Calibrator cavity. The complete assembled Artificial Ear to be tested will be positioned over the acoustic impedance with its primary cavity well concentric regarding the **AJ-063** laser drilled area. BRAUN coupler must be positioned with an **AC-4 SR** O-ring, as used on IEC-R318, because the dimension of primary cavity is equal to the diagonal of the square of holes.

The procedure allows printing-of the values correlated with the acoustic impedance of the Artificial Ear under test.

Sound Level Meter PH-18

sensitivity the procedure allows checking and calibrating the sensitivity at 1KHz and the frequency response in the range 100Hz to 8000Hz (or 200÷4000Hz) of Sound Level Meters **PH-18** (with adapter **AJ-064**).

The procedure allows to printout the results.

TAKE CARE!

Excessive flickering of the Calibrator acoustic coupler can cause a pumping effect into the calibration chamber, with consequent unstable internal pressure. The above explained calibration procedures wait for a stable internal pressure before execute a measure. That means a great increase of duration or impossibility to calibrate.

*Make sure to place the acoustic coupler on a vibrations free plane, like the base of the **AC-4** or **AC-3** Test Heads.*

4 Maintenance

The Acoustic Calibrator **CS2040** must be used and preserved with care, avoiding mechanical and climatic shock.

From the climatic point of view, the limits indicated in the Characteristics section does not must absolutely exceed, particularly for the Relative Humidity.

The exposition of the acoustic coupler to humidity at the condensation point, even if for little time, could change permanently the characteristics of the reference microphone. Sometimes the microphone must be replaced.

Do never touch the holes of **AJ-063** with your fingers; the acoustic impedance value can change.

Another important suggestion is to store and use the Calibrator far from environment dusts, especially when the acoustic impedance **AJ-063** is fitted in the Calibrator. After every use protect the cavity with the supplied protection cap.

TAKE CARE!

*Acoustic Calibrator **CS2040** and the acoustic impedance **AJ-063** need a half-year check of its characteristics at our Laboratory.*

5 Characteristics

| | |
|---|---|
| Sound Pressure Level accuracy: stability @1KHz | 94 dB re 2×10^{-5} Nw/m ² (or 1Pascal) ± 0.2 dB (@1KHz, 23°C, 60%RH, 1013 mBar when loaded with acoustic impedance of 1/4" microphone.). ± 0.2 dB from 15÷35°C and from 45÷75% RH |
| Frequency - range linearity | 100÷8000 Hz - supplied from external generator 200÷4000 Hz - supplied from external generator ± 0.2 dB 100÷4000Hz ± 0.3 dB 4000÷8000Hz |
| Equivalent volume | >150 cm ³ @200 Hz (near feedback microphone) |
| Stable level indicator | by LED for 94 dB _{SPL} ± 0.35dB |
| External generator input level impedance | -11.5 dBv ± 0.5 dB (251÷282 mV) 600Ω |
| Climatic conditions absolute maximum rating: temperature humidity | 0 ÷ 50°C 20÷90% RH without condensation |
| Power supply voltage current | ± 15Vdc ± 5% ± 10 mA |
| Dimensions (Box) weight | 390 x 290 x 90 mm 2,4 Kg |