

Ear Simulator for Telephonometry Type 4185

Ear Simulator for Telephonometry Type 4185 is designed for telephone measurements requiring an IEC 60318–1 coupler. Type 4185 converts the acoustic signal from an earphone into an electrical equivalent that takes into account the response of the human ear. It enables electroacoustic measurements on telephone handsets to be carried out under well-defined acoustical conditions. Type 4185 fulfils all relevant ITU-T, IEEE and BS recommendations.

Type 4185 consists of an acoustic coupler with built-in miniature sound source for seal checking, a microphone and a preamplifier. It fits directly into Telephone Test Head Type 4602-B and can be used with a wide range of Brüel & Kjær telephone test systems.



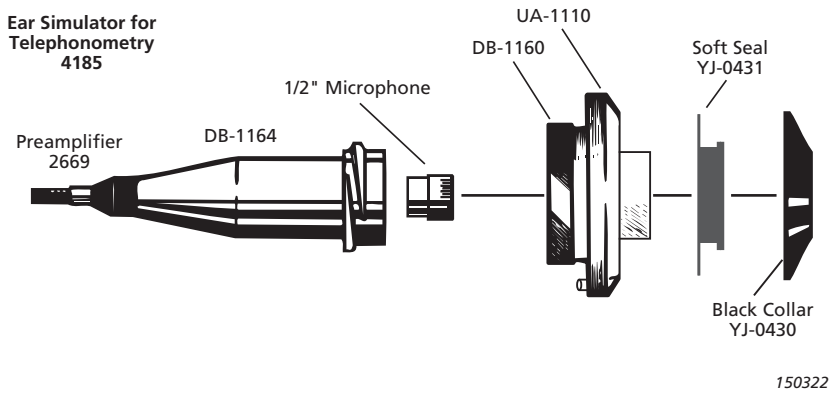
Uses and Features

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| <p>Uses</p> <ul style="list-style-type: none">• Measurements on telephone handsets• Earphone calibration | <p>Features</p> <ul style="list-style-type: none">• Performance according to ITU-T Rec. P.57 Type 1 and the IEC 60318–1 standard• Fits Telephone Test Head Type 4602-B• Incorporates a miniature sound source for automatic seal check• Includes ½" microphone and microphone preamplifier• Soft seal included• Supplied with individual calibration data according to ITU-T Rec. P.57 |
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Description

Type 4185 simulates the acoustical impedance of the average human ear, under sealed conditions. The seal between Type 4185 and the handset under test must be completely tight. The quality of this seal can be verified using the miniature sound source located inside the included Acoustic Coupler UA-1110. This sound source is a small transducer that can be excited with an external signal to produce a sound pressure inside the main cavity. If the seal between the coupler and handset is poor, the sound pressure measured by the microphone will be considerably lower at low frequencies than if the seal is tight.

Fig. 1
Type 4185 assembly

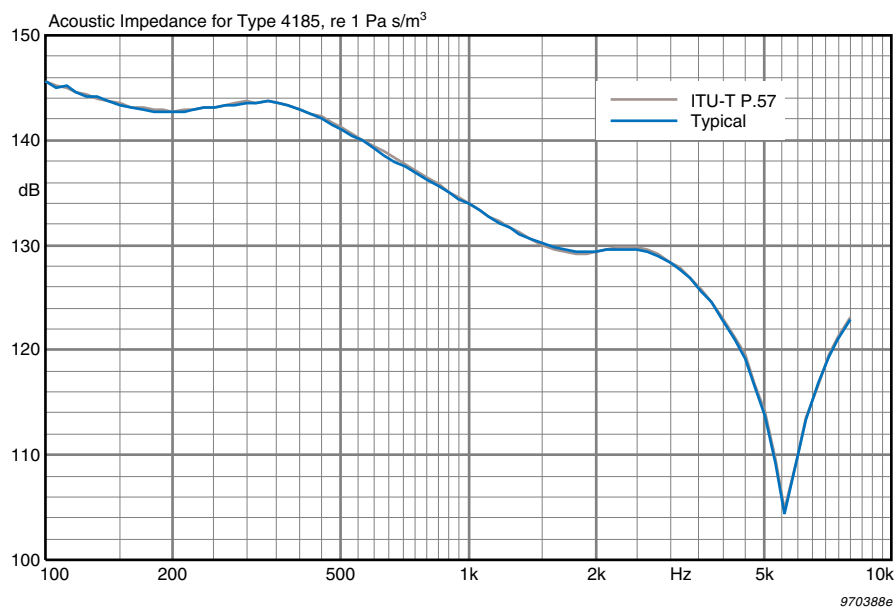


Calibration


During manufacture, the ear simulator is calibrated according to ITU-T Rec. P.57. All relevant calibration data is stated on the supplied calibration chart and is available on the Coupler Data Disk included with the ear simulator. The data is stored in a Microsoft® Excel® workbook.

The acoustic impedance and the frequency sensitivity response are individually measured as functions of frequency.

Fig. 2
Typical acoustic impedance for Ear Simulator Type 4185 and the standardized ITU-T Rec. P.57 Type 1 curve with which Type 4185 complies



Compliance with Standards

	<p>The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EU directives</p> <p>RCM mark indicates compliance with applicable ACMA technical standards – that is, for telecommunications, radio communications, EMC and EME</p> <p>China RoHS mark indicates compliance with administrative measures on the control of pollution caused by electronic information products according to the Ministry of Information Industries of the People's Republic of China</p> <p>WEEE mark indicates compliance with the EU WEEE Directive</p>
Safety	<p>EN/IEC 61010–1: Safety requirements for electrical equipment for measurement, control and laboratory use</p> <p>UL 61010B–1: Standard for Safety – Electrical measuring and test equipment</p>
EMC Emission	<p>EN/IEC 61000–6–3: Generic emission standard for residential, commercial and light industrial environments</p> <p>CISPR 22: Radio disturbance characteristics of information technology equipment. Class B Limits</p> <p>FCC Rules, Part 15: Complies with the limits for a Class B digital device</p>
EMC Immunity	<p>EN/IEC 61000–6–1: Generic standards – Immunity for residential, commercial and light industrial environments</p> <p>EN/IEC 61326: Electrical equipment for measurement, control and laboratory use – EMC requirements</p> <p>Note: The above is only guaranteed using accessories listed in this Product Data</p>
Temperature	<p>IEC 60068–2–1 and IEC 60068–2–2: Environmental Testing. Cold and Dry Heat</p> <p>Operating Temperature: 5 to 40 °C (41 to 104 °F)</p> <p>Storage Temperature: – 25 to + 70 °C (–13 to +158 °F)</p>
Humidity	<p>IEC 60068–2–78: Damp Heat: 90% RH (non-condensing at 40 °C (104 °F))</p>
Mechanical (Non-operating)	<p>IEC 60068–2–6: Vibration: 0.3 mm, 20 m/s², 10–500 Hz</p> <p>IEC 60068–2–27: Shock: 1000 m/s²</p> <p>IEC 60068–2–29: Bump: 1000 bumps at 250 m/s²</p>

General

STANDARDS

Acoustic performance according to:

- ITU-T Rec. P.57 section 4.1, Type 1
- IEC 60318–1

FREQUENCY RANGE

100 Hz to 4 kHz

DIMENSIONS (of coupler and preamplifier)

Length: 103 mm (4.06")

Max. Diameter: 60 mm (2.4")

WEIGHT (of coupler)

332 g (11.7 oz)

Miniature Sound Source

TYPICAL SENSITIVITY

–7 dB re 1 Pa/V (at 250 Hz, with flat surface termination)

MINIMUM SENSITIVITY

–11 dB re 1 Pa/V (at 250 Hz)

MAXIMUM INPUT VOLTAGE

10 V

ELECTRICAL IMPEDANCE

Approximately 1.6 Ω

RECOMMENDED FREQUENCY RANGE

100 to 400 Hz

Environmental

CALIBRATION CONDITIONS

Static Pressure: 101.3 \pm 3.0 kPa

Temperature: 23 \pm 3 $^{\circ}$ C (73.4 \pm 5.4 $^{\circ}$ F)

Relative Humidity: 60 \pm 20%

Ordering Information

Type 4185 Ear Simulator for Telephonometry

includes the following accessories in carry box:

- Type 4192: 1/2" Condenser Microphone
- Type 2669: 1/2" Microphone Preamplifier
- UA-1110: Acoustic Coupler (with built-in miniature sound source and 1 \times YJ-0431)
- DB-1160: Ring for Acoustic Coupler
- DB-1164: Adaptor Sleeve for Acoustic Coupler
- 4 \times YJ-0431: Soft Seal (additional)
- AO-0419: Microphone Cable, 3 m (10 ft), LEMO to LEMO
- AO-0122-D-030: Low-noise Cable for Miniature Sound Source, 3 m (10 ft), 10–32 UNF to 10–32 UNF
- JP-0145: BNC Input Adaptor
- Calibration Chart
- Coupler Data Disk

OPTIONAL ACCESSORIES

Type 4231 Sound Calibrator

SERVICES AVAILABLE

4185–CFF Factory Standard Calibration

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