

Wideband Ear Simulator Type 4195-Q

Wideband Ear Simulator for Production Line Testing

Wideband Ear Simulator Type 4195-Q has been designed for realistic and comparable telephone receiver response measurements both on the production line and in the laboratory.

The unique features of this Wideband Ear Simulator establish the necessary link between the measurements performed during the development of a telephone receiver and the actual manufacturing of the receiver.

The design and performance of Type 4195-Q is based on ITU – T Rec. P.57 Artificial Ear Type 3.2.



Features

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- Customized sealing option
- Design based on Artificial Ear Type 3.2 (simplified pinna simulator) described in Rec. ITU-T Rec. P.57
- Includes IEC 60318 – 4 coupler with prepolarized ½" microphone and CCLD* preamplifier for easy connection to data acquisition front ends that support CCLD inputs

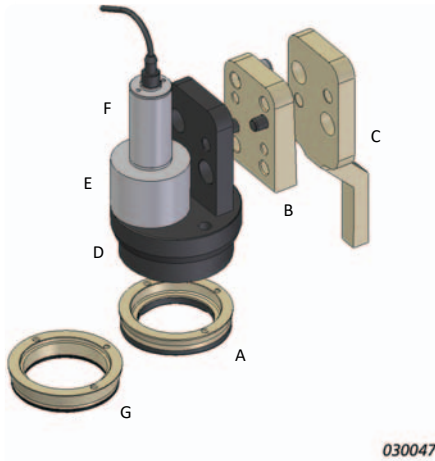
* Constant current line drive, also known as DeltaTron®, (ICP and IEPE compatible)

- Easy calibration/verification
- Fast and easy to swap between telephone designs on the production line
- Factory calibration according to ITU – T Rec. P.57
- Similar performance to Wideband Ear Simulator Type 4195
- Identical measurement results in production and laboratory
- Controlled leakage and high repeatability
- Improved coupler quality and stability

Description

Wideband Ear Simulator Type 4195-Q has been developed especially for the quality control of telephonic handsets on the production line. It is an innovative concept that allows full measurement compatibility between the production line and the laboratory, as well as the verification department, using a design based on the ITU – T Rec. P.57, Type 3.2 simplified pinna simulator.

Fig. 1
The complete Ear Simulator comprises customized and standard parts

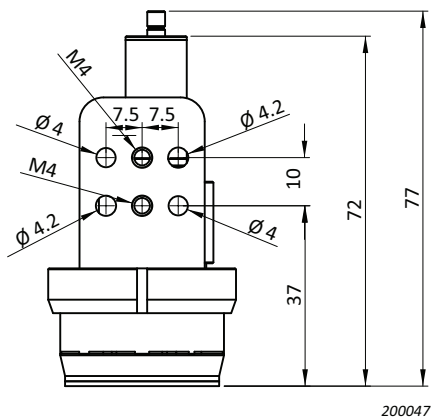


The Ear Simulator comprises standard components but can also be altered using customer-made parts. The standard parts are reusable and can be employed on all telephone types, models and shapes, while the customized parts are specially designed to fit a specific telephone model and/or shape. The front of a standard adapter ring is made of rubber to protect the handset surface.

For laboratory and off-line verification use, the Ear Simulator can also be mounted in Brüel & Kjær Telephone Test Head Type 4602-B for direct comparison of QC and laboratory measurements. Order Adapter for Test Head UA-1573 for this purpose.

If necessary, you can implement design and development of your own parts, shown as parts A – C in Fig. 1, to fit individual handsets. In order to ensure correct interfacing, Brüel & Kjær can advise customers on how to design these parts.

Fig. 2
Coupler Dimensions
(Positioning tolerance onto handset: ± 0.2 mm
Vertical Pressure Force: 10 – 15 N)



A: Customized Adapter Ring (for best interfacing fit)
B: Angle Adapter (for positioning the coupler correctly in relation to the handset)
C: End Stop (for positioning the coupler correctly in relation to the handset)

Standard Parts Type 4195-Q:
D: Simplified Pinna Simulator
E: IEC 60318-4 coupler with prepolarized microphone
F: ½" CCLD Microphone Preamplifier Type 2695 (CCLD, micro-DOT connection)
G: Standard Adapter Ring (for testing/sensitivity verification of standard shaped/flat telephone designs)

Calibration and Verification

Fig. 3
The coupler mounted with the Standard Adapter Ring for 'on-the-line' sensitivity verification, using Sound Calibrator Type 4231 with Calibration Adapter DP-0939



During manufacture, the Ear Simulator is calibrated according to ITU – T Rec. P.57, just like Wideband Ear Simulator Type 4195.

All relevant calibration data is stated on the supplied calibration chart and is also available on the calibration data disk.

The sensitivity at 1 kHz in V/Pa is verified by swapping the Customized Adapter Ring with the Standard Adapter Ring for calibration and mounting it as shown in Fig.3. Since the Ear Simulator is designed for production line testing and consists of very stable components, this verification is only necessary when there is a need for verifying (or troubleshooting) the production line system.

Wideband Ear Simulator Type 4195-Q can be used in test boxes, on the production line, and with a test head (for example Type 4602), which is used in the laboratory.

Standard Parts



Standard parts (see Fig. 1) are reused when a new telephone model is to be tested.

- Type 4195-Q: contains all standard parts including ½" CCLD Microphone Preamplifier Type 2695 (short) and Factory Calibration of the coupler
- Type 4195-Q-001: as for Type 4195-Q but supplied with ½" CCLD Microphone Preamplifier Type 2671 (long)
- Type 4195-Q-002: as for Type 4195-Q-001 but without preamplifier

Custom Parts

Customized parts (see Fig. 1) are developed by the customer for specific telephone models. Brüel & Kjær can advise on the interfacing of customer-made part(s).

Compliance with Standards

 	CE-mark indicates compliance with: EMC Directive and Low Voltage Directive. C-Tick mark indicates compliance with the EMC requirements of Australia and New Zealand
Safety	EN/IEC 61010–1: Safety requirements for electrical equipment for measurement, control and laboratory use ANSI/UL 61010–1: Safety requirements for electrical equipment for measurement, control and laboratory use
EMC Emission	EN/IEC 61000–6–3: Generic emission standard for residential, commercial and light industrial environments EN/IEC 61000–6–4: Generic emission standard for industrial environments CISPR 32: Radio disturbance characteristics of information technology equipment. Class B Limits FCC Rules, Part 15: Complies with the limits for a Class B digital device
EMC Immunity	EN/IEC 61000–6–1: Generic standards – Immunity for residential, commercial and light industrial environments EN/IEC 61000–6–2: Generic standards – Immunity for industrial environments EN/IEC 61326–1: Electrical equipment for measurement, control and laboratory use – EMC requirements Note: The above is only guaranteed using accessories listed in this Product Data sheet
Temperature	IEC 60068–2–1 & IEC 60068–2–2: Environmental Testing. Cold and Dry Heat Operating Temperature: –10 to +50 °C (14 to 122 °F) Storage Temperature: –25 to +70 °C (–13 to +158 °F)
Humidity	IEC 60068–2–78: Damp Heat: 90% RH (non-condensing at 40 °C (104 °F))
Mechanical	Non-operating: IEC 60068–2–6: Vibration: 0.3 mm, 20 m/s ² , 10 – 500 Hz IEC 60068–2–27: Shock: 1000 m/s ² , 6 directions IEC 60068–2–29: Bump: 1000 bumps at 250 m/s ²
Enclosure	IEC 60529 (1989): Protection provided by enclosures: IP 20

Conformance with ITU – T Rec. P.57 (when mounted with Standard Adapter Ring UC-5366)

AVAILABLE CONFIGURATIONS – STANDARD PARTS

Name	Type/Part No.	4195-Q	4195-Q-001	4195-Q-002
Simplified Pinna Simulator	DB-3800	•	•	•
IEC 60318 – 4 Coupler with Prepolarized Microphone	UA-1567	•	•	•
Standard Adapter Ring for Calibration	UC-5366	•	•	•
½" CCLD Microphone Preamplifier	2695	•		
½" CCLD Microphone Preamplifier	2671		•	

Accessories Available

DP-0939 Calibration Adapter for Type 4231
 UA-1573 Adapter for Test Head Type 4602-B

Additional Instrumentation

CONDITIONING

Type 2690 NEXUS Microphone Conditioning Amplifier
 Type 1704-A-002 2-channel Battery-powered CCLD Signal Conditioner

OTHER

Type 4231 Sound Calibrator

CABLES

AO-0531-D-050 5 m (16.40 ft) Microdot-to-BNC Cable for ½-inch CCLD Microphone Preamplifier Type 2695 (included with Type 2695)
 AO-0087-D-030 3 m (9.84 ft) BNC-to-BNC Cable for ½-inch CCLD Microphone Preamplifier Type 2671

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