

# Product Data

## Telephone Test Head — Type 4602B

### USES:

- Accurate and repeatable positioning of telephone handsets for electroacoustic measurements
  - Testing of almost all telephone handset designs, including handsets with antennas and handsets with asymmetrically positioned transducers
  - Quality control of complete production batches or quality assurance of test samples
  - Type approval and conformance testing
- Measurements in standardized speaking positions: LRGP, HATS, AEN (ITU-T) and REF (OREM A)

### FEATURES:

- Facilitates standardized measurements on both transmitter and receiver
- Accommodates IEC 318, NBS 9A and ITU-T Type 3.2 Artificial Ears

Telephone Test Head Type 4602B allows accurate and repeatable positioning and subsequent measurement of a telephone handset in the standardized LRGP, HATS and AEN positions as recommended by the ITU-T, as well as in the REF position (OREM A). It is used as a general test jig with other Brüel & Kjær measurement equipment. Type 4602B has been updated to accommodate handsets with antennas. An upgrade kit is available for updating earlier Test Heads Type 4602.

- The revolving holder arm enables simple, fast and accurate positioning of handsets. The arm also incorporates a calibrated scale for adjusting the handset retaining force
- Adaptable to a wide variety of handsets, with provision for mounting dedicated positioning jigs
- Simple to configure for various standards
- Optimized acoustical design minimizes diffraction and reflection
- High damping of mechanical vibrations enables accurate acoustical sidetone measurements
- Spring-loaded mounting of the earcap with adjustable force to prevent acoustical leakage
- Easy access to the Mouth Simulator and Artificial Ear for calibration
- Upgrade kit available for updating earlier Telephone Test Heads Type 4602 to Type 4602 B

*Fig.1 Telephone Test Head Type 4602B shown with Mouth Simulator Type 4227, in LRGP modal position, and Ear Simulator for Telephonometry Type 4195 (both must be ordered separately)*



## Description

The appearance of diversified new telephone designs with asymmetrically positioned transducers, and mobile telephones with shapes differing vastly from previous traditional handsets, has made a requirement for a very versatile test head.

Brüel & Kjær's new Telephone Test Head Type 4602B is a test jig which allows accurate positioning of telephone handsets, mobile telephones and cordless telephones relative to the Mouth Simulator and the Artificial Ear, enabling standardized measurements to be performed.

The lower main plate of the Test Head supports the Mouth Simulator Type 4227. This is accurately mounted on a suspended bushing to prevent transmission of vibrations from the Mouth Simulator to the handset and the Artificial Ear. Changing between the standardized speaking positions is simply a matter of selecting one of the associated and clearly marked mounting jigs.

The upper main plate holds the artificial ear assembly and the handset. The Artificial Ear is mounted in a spring-loaded mechanism which gives a well-defined force against the earcap, to prevent acoustical leakage. The force is indicated on a scale for easy adjustment.

### Positioning Handsets

The handset is accurately held in position by a stop screw, two sets of adjustable rods and a holder arm. Alternatively, for QC purposes a custom-built jig can be fitted to the upper main plate to hold the handset.

A coupler hole ring is positioned above the Artificial Ear assembly to define the ear reference plane. It has a scale for positioning the handset in the longitudinal direction with an adjustable stop screw. The centre of the handset earcap is easily established with the Handset Gauge. Two different coupler hole rings are provided to increase possibilities for optimum fitting of handsets. The coupler hole ring with the larger hole allows the artificial ear assembly to be moved further up to allow for handsets with a larger concavity.

### Updated Test Head

The new Type 4602B test head provides more space and adjustment range to allow for the new generation of slim handsets as well as the thick



Fig.2 Telephone Test Head Type 4602B allows positioning of almost all telephones. The redesigned structure has room for mobile telephone antennas and batteries. The Test Head is supplied with extra alignment rods that allow non-symmetrical handsets to be positioned accurately and reliable

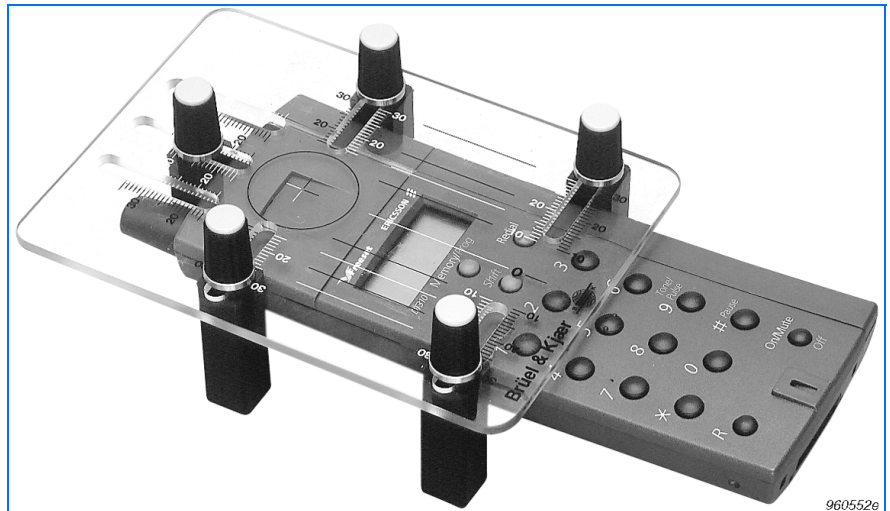


Fig.3 Handset Gauge for aligning non-symmetrical handsets



Fig.4 A number of ear simulators are available from Brüel & Kjær to accommodate all relevant telephone standards and recommendations

mobile telephones fitted with high capacity battery packs.

The adjustable stop screw can be angled in different positions so that handsets with antennas in various positions can be mounted.

### Alignment Rods and Gauge

For symmetrical handsets the adjustable self-centring alignment rods offer quick and accurate positioning in the latitudinal direction. A pair of handset alignment rods with offset adjustment are provided with the test head to allow positioning of the increasing number of handsets with asymmetrically positioned transducers. A handset gauge for non-symmetrical handsets (Fig.3) is also provided.

A rubber pad on the holder arm holds the handset and distributes the pressure. The holder arm can be ro-

tated for easy access and has a calibrated scale for adjusting the force.

The solid base has vibration-dampening rubber feet and a slot to arrange the cables and eliminate cable vibrations.

### Updating Previous Test Heads

#### Type 4602

Previous Telephone Test Heads Type 4602 can be updated to the functionality of the new 4602B version to allow positioning of mobile handsets with antennas, by using Upgrade Kit UA 1403.

### Ear Simulators Type 4185 and 4195

Ear Simulator for Telephonometry Type 4185 is an IEC 318 coupler for

testing high impedance handsets under well defined sealed conditions. It fulfils ITU-T Rec. P.57 Type 1 and relevant IEEE and BS recommendations.

Wideband Ear Simulator for Telephonometry Type 4195 can be used for testing both high- and low-impedance telephone handsets. It provides a very realistic acoustic load to the telephone under test and therefore exposes the acoustical differences between telephone handsets as they appear in real use. This is accomplished by a built-in leakage which can be selected as high or low grade. The Wideband Ear Simulator conforms to ITU-T Rec. P.57, Type 3.2.

Ear Simulators are not supplied with Type 4602B and must be ordered separately.

## Specifications 4602B

### SPEAKING POSITIONS:

LRGP position (ITU-T Rec. P.76)

HATS position (ITU-T P.58)

REF position (OREM A)

AEN position (ITU-T Rec. P.76)

### PRECISION OF SPEAKING POSITIONS:

The position of the mouth reference point is within 1 mm of the nominal position in the mouth axis direction, and within 2 mm of the nominal position perpendicular to this (i.e., mouth radially)

### HANDSET GAUGE FOR SYMMETRICAL HANDSETS:

Has a 10 to 40 mm scale with 1 mm graduations for reading the distance from the centre of the earcap to the top of the handset

### HANDSET GAUGE FOR NON-SYMMETRICAL HANDSETS:

The maximum lateral offset adjustment range of the handset is  $\pm 18$  mm with respect to the Ear Reference Point.

Note: The adjustment range is reduced as the handset approaches the maximum allowable handset width (65 mm).

In the longitudinal direction the adjustment range is 22 mm with respect to the Ear Reference Point.

### END STOP:

Can be adjusted from 13 to 38 mm relative to the centre of the coupler hole ring. Maximum length of handsets from the centre of the earcap to the top of the handset is 47 mm without the

stop screw, and 59 mm without the rear alignment rods

### HANDSET ALIGNMENT RODS:

Two adjustable self-centring rods for positioning handsets. Maximum allowable width of handsets is 65 mm

### HANDSET ALIGNMENT RODS WITH OFFSET ADJUSTMENT:

Two sets of adjustable rods for positioning handsets. The rods are individually adjustable to accommodate asymmetrical handsets. Adjustment range from 10 to 33 mm

### COUPLER HOLE RING (40mm hole):

For earcaps with concavity from 0 to 3.9 mm (measured at edge of IEC ear). Has a 0 to 20 mm scale (1 mm graduations) along the periphery, and a 20 to 36 mm scale under the stop screw

### COUPLER HOLE RING (50mm hole):

For earcaps with concavity from 0 to 7.0 mm (measured at edge of IEC ear). Has a 0 to 25 mm scale (1 mm graduations) along the periphery, and a 25 to 36 mm scale under the stop screw

### HOLDER ARM:

Has a calibrated scale for adjusting the force on the handset from 10 to 28 N (2 N graduations). Accommodates handsets up to 55 mm height

### EAR FORCE:

The force that the Artificial Ear exerts against an earcap can be adjusted from 0 to 10 N

### MOUNTING OF TEST HEAD FOR QUALITY CONTROL:

The upper main plate (for holding the handset) has four 5 mm threads for mounting a custom-built handset jig.

The lower main plate (for holding the Mouth Simulator) has four 5 mm threads for mounting the Test Head in a quality control setup.

The holder arm has a 5 mm thread for mounting an alternative holder pad

### DIMENSIONS:

**Height:** 430 – 468 mm (16.9 – 18.4 in)

**Width:** 170 mm (6.7 in)

**Depth:** 260 mm (10.2 in)

**Weight:** 5.4 kg (11.9 lb.)

**Weight:** 7.4 kg (16.3 lb.) with Mouth Simulator

# Ordering Information

## **Type 4602 B:** Telephone Test Head

### **Includes the following accessories:**

Main column with upper and lower main plates and holder arm.

2×UA 1210: Handset Alignment Rods

4×UA 1400: Two sets of Handset Alignment Rods with Offset Adjustment

DB 3339: Coupler Hole Ring (40 mm)

DB 3340: Coupler Hole Ring (50 mm)

DK 1247: LRGP Positioning Jig

DK 1248: HATS Positioning Jig

DK 1249: REF Positioning Jig

DK 1250: AEN Positioning Jig

DS 0884: Mounting Bushing for Mouth Simulator

UA 1206: Handset Gauge

UA 1401: Handset Gauge for Non-symmetrical Handsets

YS 9215: M5 Screw for Positioning Jigs

UA 1227: Finger Screw for Mouth Simulator

2×YS 9209: M5 Screw for DS 0884

QA 0121: Allen Key (M5 screws)

YQ 0538: M12 Allen Screw

2×JP 0189: Short Banana Plug

2×DK 1252: Clamp for Handset Alignment Rods

2×UA 1228: Screw for DK 1252

## **Optional Accessories**

**Type 4227:** Mouth Simulator

**Type 4135:** 1/4" Compressor Microphone

**Type 2633:** Microphone Preamplifier

**Type 4195:** Wideband Ear Simulator for Telephonometry

**Type 4185:** Ear Simulator for Telephonometry

**WA 0614:** Templates for checking the AEN and LRGP speaking positions

**UA 1403:** Upgrade Kit for the previous version of Telephone Test Head Type 4602

### **For REF Position (OREM A):**

**DB 1161:** NBS9A Coupler

**UA 0277:** SFERT Baffle

**DB 1169:** Coarse Thread Adaptor

**DB 0375:** 1/2" to 1" Preamplifier Adaptor

**Type 4144:** 1" Condenser Microphone

**Type 2669:** 1/2" Microphone Preamplifier

Brüel&Kjær reserves the right to change specifications and accessories without notice

**Brüel & Kjær** 

### WORLD HEADQUARTERS:

DK-2850 Naerum · Denmark · Telephone: +45 45 80 05 00 · Fax: +45 45 80 14 05 · Internet: <http://www.bk.dk> · e-mail: [info@bk.dk](mailto:info@bk.dk)

Australia (02 ) 9450-2066 · Austria 00 43-1-865 74 00 · Belgium 016/44 92 25 · Brazil (011) 246-8166 · Canada: (514) 695-8225 · China 10 6841 9625 / 10 6843 7426

Czech Republic 02-67 021100 · Finland 90-229 3021 · France (01) 69 90 69 00 · Germany 0610 3/908-5 · Holland (0)30 6039994 · Hong Kong 254 8 7486

Hungary (1) 215 83 05 · Italy (02) 57 60 4141 · Japan 03-3779-8671 · Republic of Korea (02) 3473-0605 · Norway 66 90 4410 · Poland (0-22) 40 93 92 · Portugal (1) 47114 53

Singapore (65) 275-8816 · Slovak Republic 07-37 6181 · Spain (91) 36810 00 · Sweden (08) 71127 30 · Switzerland 01/94 0 09 09 · Taiwan (02) 713 9303

United Kingdom and Ireland (0181) 954-236 6 · USA 1 - 800 - 322 - 2040

Local representatives and service organisations worldwide

[www.valuetronics.com](http://www.valuetronics.com)