



HMS II.3 with Handset Positioner HHP IV (Option)



HMS II.3 on Torso Box HTB IV

DESCRIPTION

HMS II.3 is ideal for all measurements in the field of telecommunications in realistic conditions. The diffraction and reflection characteristics of HMS II.3 are comparable to those of a listening person.

HMS II.3 provides the user with both a recording and speech simulation system and can therefore be used for measurements in sending and receiving directions. HMS II.3 has been designed for measuring all kinds of transducers such as handsets, headsets and hands-free devices, including voice-operated equipment as well as hearing aids and hearing protectors.

The artificial outer ear (pinna) is used for recording. The acoustic characteristics of this artificial ear are modeled on those of the human ear. The ear simulator (right ear) is internally connected according to IEC 60318-4 (2010-01).

The artificial head is available in two variants: HMS II.3-33 or HMS II.3-34. HMS II.3-33 is equipped with the anatomically shaped pinna simulator according to ITU-T Recommendation P.57 Type 3.3. This pinna simulator is recommended for use when the anatomy of the human ear plays an important part (e.g. for the measurement of intra-concha headsets or hearing aids). HMS II.3-34, by contrast, is fitted with a simplified pinna simulator according to ITU-T Recommendation P.57 type 3.4. This pinna simulator is modeled on the mechanical stiffness of the human ear and its acoustical properties. The use of this pinna simulator is recommended for tests of sound sources (e.g. handsets) where the application force to the ear significantly influences the measurement result.

The defined sound field produced by the artificial mouth is laid down in ITU-T Recommendation P.58. The free-field transfer characteristics of the artificial mouth, measured at various positions, correspond to ITU-T P.58. They differ from the requirements in ITU-T Recommendation

P.51, particularly with respect to the far field, due to diffraction and reflection at the shoulder and torso, which are typical for test person measurements. The shoulder and torso simulation of HMS II.3 reproduces the acoustic behavior of test persons.

The geometrical dimensions of HMS II.3 meet the requirements of ITU-T Recommendation P.58. This document also defines essential head contour data at various section planes. HMS II.3 meets the tolerances for all head section planes.

The torso can be used to integrate additional electronics accessories. The compact design allows easy handling and transportation of the complete system.

SIGNAL CONDITIONING

For the measurement of telecom terminal equipment, HMS II.3 is connected to the communication analysis system ACQUA via the measurement front end MFE VI.1.

In combination with MFE VI.1 and the software option MFEVI-BEQ or with a digital binaural equalizer BEQ II.1 (accessory), the accurate individual equalization of binaural acoustical signals is enabled and different equalization variants are made available, such as requested e.g. in ITU-T Recommendation P.581.

The measured signals can directly be recorded by a computer. It is possible to store the special settings of the recording combined with the signal and to take them automatically into account during the playback process.

The playback of signals via the artificial mouth is carried out with the amplifier included in MFE VI.1. Via ACQUA, the mouth equalization is comfortably conducted by the user.

In conjunction with MFE VI.1, playback is also possible in vehicles (12 V on-board power). For recording purposes, HMS II.3 can be operated completely independent of mains power in conjunction with MFE VI.1.

DATA SHEET

HMS II.3-33 (Code 1230.1)

HMS II.3-34 (Code 1230.2)

HEAD Measurement System with Ear Simulator and Artificial Mouth

Overview

HMS II.3 is an Artificial Head Measurement System for measurements of the performance of close-to-the-ear transducers: handsets, headsets, headphones, hearing protectors and hearing aids. Without any restrictions, HMS II.3 furthermore allows its users to carry out measurements of far-to-the-ear transducers such as hands-free equipment.

HMS II.3 has been developed for acoustic measurement of telephone terminal equipment and meets the requirements laid down by ITU-T Recommendations P.57 and P.58. The simulation of the head geometry has been reduced to the acoustically relevant structures of the human anatomy and results in a recording technology which corresponds to realistic conditions for handsets and hands-free equipment. HMS II.3 is equipped with an impedance simulator in the right ear and with an artificial mouth.

Taking into account the frequency range of real speech signals, the artificial mouth can play back the complete spectrum of human voice for all relevant levels with adequately low distortion. Thus, superwideband as well as fullband measurements are also possible in sending direction.

The artificial head is available in two variants: HMS II.3-33 with pinna simulator type 3.3 or HMS II.3-34 with pinna simulator type 3.4. Both pinna simulator types, of course, are supported by both HMS variants and are available as optional accessories.

EXTENSIONS

Optionally, handsets can be mounted at the Artificial Head in reproducible positions and with a definable application force using the Handset Positioners HHP III.1 (manual control) or HHP IV (motorized, automatable control).

For the binaural measurement of close-to-the-ear sound sources such as head phones and active/passive hearing protection systems the left ear can also be equipped with an ear simulator.

APPLICATIONS

- Measurement of telephone terminal equipment
- Measurement of hands-free devices
- Measurement of headsets
- Testing of headphones
- Testing of active and passive hearing protection systems for industrial use
- Testing of combinations of hearing protection systems and headphones
- Testing of hearing aids
- Use in quality control for special measurements and in standard measuring

FEATURES

- According to ITU-T P.58
- Handset Positioner HHP III.1 or HHP IV (Option)
- Award-winning design

Receiving direction (ear):

- Anatomically shaped pinna simulator (left/right) according to ITU-T P.57 Type 3.3 and simplified pinna simulator (left/right) according to ITU-T P.57 Type 3.4
- Individual digital equalization in conjunction with MFE VI.1 and software option MFE VI-BEQ (Accessory) or with Binaural Equalizer BEQ II.1 (Accessory)
- Transmission range 3 Hz - 20 kHz
- Containing an ear simulator according to IEC 60318-4 (2010-01)

- Minimal inherent noise
- Compatible with human hearing and conventional measuring technology
- Portable, mains-independent recordings in conjunction with MFE VI.1 (Accessory)

Sending direction (mouth):

- Artificial mouth according to ITU-T P.58
- Digital equalization via ACQUA
- Transmission range almost 50 Hz - 20 kHz (cf. technical data), thus allowing the reproduction of real speech for superwide-band and fullband measurements
- Playback also possible in vehicles (12 V on-board power) in conjunction with MFE VI.1 (Accessory)

STANDARD DELIVERY ITEMS

Both variants of the artificial heads only differ with regard to the pinna simulator type and the availability of ECS (ear canal simulation):

HMS II.3-33 (Code 1230.1):

- **HEL/HER IV.2 (Code 1381/1382):** Pinna simulator (left/right) according to ITU-T P.57 Type 3.3, anatomically shaped

HMS II.3-34 (Code 1230.2):

- **HEL/HER III.1 (Code 1248/1249):** Pinna simulator (left/right) according to ITU-T P.57 Type 3.4
- **ECS I.0-I.3 (Code 1357):** Ear canal simulation, cylindrical/small/medium/large (only in conjunction with HEL/HER III.1; please specify ECS type when ordering)

All other components are identical for both variants of the artificial head:

- **HIS R (Code 1232):** Impedance simulation, right ear
 - **HTB V (Code 1374):** HEAD torso box for portable artificial head measurements
 - **CSB II (Code 9849):** Adapter Speakon Male <> Banana plug
 - **Accessories case HCC-HMS (Code 1641)** containing microphone holder with 1/2" clip-on adapter, MRP pointer, lip ring, calibration adapter, two allen keys 2.5 and 3 mm, ear canal key
- Note: if HHP III.1 is ordered simultaneously, these accessories are placed in the accessories case of HHP III.1. Thus, HCC-HMS is not required and not included in the delivery.*

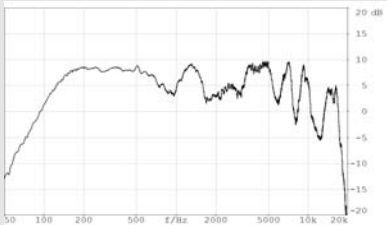

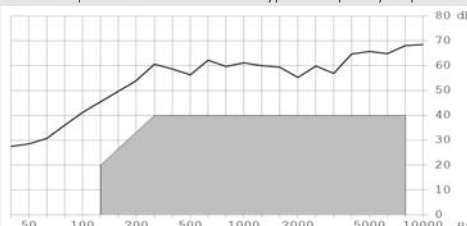
Manual

OPTIONS

- **HIS L (Code 1231):** Impedance simulation, left ear, including microphone
- **HEL/HER III.1 (Code 1248/1249):** Pinna (left/right) according to ITU-T P.57 Type 3.4
- **HEL/HER IV.2 (Code 1381/1382):** Pinna (left/right) according to ITU-T P.57 Type 3.3, anatomically shaped
- **ECS I.0-I.3 (Code 1357):** Ear canal simulation, cylindrical/small/medium/large
- **HHP III.1 (Code 1403):** Handset positioner according to IEEE 269 and ITU-T P.64, with accessories case HCC-HHP III.1
- **HHP IV "MotoMount" (Code 1406):** Motorized handset positioner according to IEEE 269 and ITU-T P.64, with accessories case HCC-HHP IV

ACCESSORIES

- **MFE VI.1 (Code 6462):** Measurement front end with integrated mouth amplifier and level converter
- **MFEVI-BEQ (Code 6461):** Software optional binaural equalization for MFE VI.1
- **BEQ II.1 (Code 1347):** Digital binaural equalizer with individually programmable filters
- **HD IV.1 (Code 2380):** Dynamic headphones for PEQ V
- **HWS (Code 1960):** Windshield for outdoor recording
- **HMT III (Code 1961):** Height-adjustable tripod for HMS
- **HSC IV (Code 1524):** HMS carrying case
- **TLP (Code 1967):** Triaxial laser pointer for HMS II.3 positioning

Technical Data	
Receiving characteristics (Ear)	
Transmission range:	3 Hz – 20 kHz
Dynamic range:	> 110 dB
Frequency response:	According to ITU-T P.58
Directivity characteristics:	According to ITU-T P.58
Sending Direction (Mouth)	
Transmission range:	Almost 50 Hz – 20 kHz
Load limit:	20 W (sine), 50 W (music)
Impedance:	4 Ω
Distortion factor:	Exceeds ITU-T P.58
 <p>Typical frequency response of unequaled mouth</p>  <p>Typical frequency response of equalized mouth</p>  <p>Typical curve of signal-to-THD ratio at 0dBPa (shaded area: P.58 tolerance scheme)</p>	
Environmental conditions	
Operating temperature range:	0°C - 65°C, 32°F – 149°F
In-store temperature range:	-40°C - 80°C, -40°F – 176°F
Housing (Head-and-shoulder simulation without torso box)	
Overall dimensions (WxHxD):	approx. 450 x 400 x 180 mm
Weight:	approx. 5.4 kg

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