Piano

BASIC – PLUS – PLUS VRA

Clinical Audiometer

TECHNICAL SPECIFICATIONS

Description
Piano is an advanced clinical audiometer with two separate and independent channels. Piano features a complete battery of tests, all easily managed via a wide touch screen color display.

The “Plus VRA” version of the Piano audiometer forms the heart of a professional VRA system and can use as reinforces either traditional cabinet toys or videos and images on one or more displays.

Classification
Type 1 pure tone audiometer (EN 60645-1)
Type A or A-E speech audiometer (EN 60645-2)
Plus model: HF audiometer (EN 60645-4)

Available signals
Stimulus: pure tone, warble tone
2 external inputs for speech audiometry
MIC input for live speech audiometry
Internal input (flash memory) for speech audiometry
Masking noises: NBN, WN, SN

Signals specifications
Attenuator step: 1 and 5 dB
Presentation: Continuous, Pulsed (0.5, 1, 2 Hz or selectable frequency), Single Pulse (with selectable length)
Warble: 5 Hz sin wave modulating signal

Available outputs and transducers
AC: TDH-39 headphones, ER-3A or ER-5A insert earphones, HDA-200 headphones (only Plus)
BC: B-71 bone vibrator
Free field
Insert masking earphone: IME-100

Pure tone: frequencies and maximum levels (dB HL)

<table>
<thead>
<tr>
<th>Freq (Hz)</th>
<th>AC TDH39</th>
<th>AC HDA200</th>
<th>AC ER-3A</th>
<th>AC ER-5A</th>
<th>BC</th>
<th>FF (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>100</td>
<td>100</td>
<td>105</td>
<td>100</td>
<td>45</td>
<td>85</td>
</tr>
<tr>
<td>500</td>
<td>120</td>
<td>110</td>
<td>110</td>
<td>110</td>
<td>65</td>
<td>95</td>
</tr>
<tr>
<td>750</td>
<td>120</td>
<td>110</td>
<td>115</td>
<td>120</td>
<td>70</td>
<td>95</td>
</tr>
<tr>
<td>1,000</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>75</td>
<td>95</td>
</tr>
<tr>
<td>1,500</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>80</td>
<td>95</td>
</tr>
<tr>
<td>2,000</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>80</td>
<td>95</td>
</tr>
</tbody>
</table>

(*) The values refer to “normal” range; add 10 dB to each value in case of “extended range” option selected.

Speech audiometry: maximum levels (dB HL)

<table>
<thead>
<tr>
<th>AC</th>
<th>AC</th>
<th>AC</th>
<th>BC</th>
<th>FF</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDH39</td>
<td>ER-3A</td>
<td>ER-5A</td>
<td>55</td>
<td>Normal: 75</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>100</td>
<td>55</td>
<td>Extended: 85</td>
</tr>
</tbody>
</table>

Patient – operator communication and monitoring
Talk over: via built-in or external microphone
Talk back: patient microphone input (clip-on microphone included)
Both channels and patient voice monitored through the built-in speaker, external speakers or monitor headset (included)

Patient response button
Up to 2 patient response buttons (left and right).

Available tests
- Pure tone audiometry
- Auto threshold (modified Hughesone-Westlake)
- Speech audiometry (2 channels)
- Alternated Loudness Balance (ABLB)
- Monaural Loudness Balance (MLB)
- Short Increment Sensitivity Index (SISI): automatic score; 1 dB increment (5 dB for familiarization)
- Difference Limen for Intensity (DLI), with increments between 0.2 and 5 dB
- Tone decay, with 60 or 120 sec. duration
- Stenger, with pure tone or speech stimulation
- 2 independent channels Master Hearing Aid
- HF audiometry: from 8 to 20 kHz
- Multi Frequency: frequency steps selectable between 1/3, 1/6, 1/12 and 1/24 octave
- Bekesy Test: 125 Hz to 8 kHz fixed or sweep frequency, continuous or pulsed tone
- Masking Level Difference (MLD): noise and / or signal out of phase

Only on Piano Plus VRA:
- Visual Reinforcement Audiometry (VRA) test
- Conditioned Play Audiometry (CPA) test

Internal flash memory
Used to store the speech material (wav format)
Capacity: 2 GB (about 3 hours of speech)
Speech material upload: through ATIT software (incl.)

Printer
Optional integrated thermal printer
Paper size: 112 mm

Calibration
Validity: 12 months
All the parameters set through the device software

Computer interface
Connection: USB (driverless)
Compatible software: Inventis Daisy with Maestro module, Noah with “Maestro for Noah” module

Display
Type: Graphical colour TFT LCD
Size: diagonal 7", 150 mm x 90 mm
Resolution: 800 x 480
Resistive touch screen

Power supply
Without integrated printer:
Consumption: 8 Watts
Power supply: 6V, 1.67A cont., through an external medical grade 100-240 Vac 50/60 Hz power supply

With integrated printer and Plus VRA version:
Consumption: 25 Watts
Power supply: 6V, 6A cont., through an external medical grade 100-240 Vac 50/60 Hz power supply

Mechanics
Without integrated printer:
Size (WxDxH): 32 x 32 x 15 cm / 12.6 x 12.6 x 5.9 in
Weight: 2.0 Kg / 4.4lbs

With integrated printer:
Size (WxDxH): 32 x 39 x 15 cm / 12.6 x 15.4 x 5.9 in
Weight: 2.5 Kg / 5.5lbs

Freight packing
Size (WxDxH): 47 x 40 x 35 cm / 18.5 x 15.8 x 13.8 in
Gross weight (without printer): 4.4 Kg / 9.7lbs
Gross weight (with printer): 4.9 Kg / 10.8lbs

Applicable standards
Pure tone audiometry: EN 60645-1, Type 1
Speech audiometry: EN 60645-2, Type A or A-E (depending on the equalization filter status)
High Frequency audiometry: EN 60645-4
Electrical safety: EN 60601-1, Class II type BF (model Basic and Plus without printer), Class I type BF (model VRA and devices with integrated printer)
EMC: EN 60601-1-2

CE certificate
93/42/EEC classification: Class Ila
Classification rule (Annex IX, 93/42/EEC): 10
Notified body: TÜV SÜD Product Service GmbH (0123)
Number of CE certificate: G1 12 065346 006

Product codes
10147: Piano model Basic – Clinical audiometer
10164: Piano model Basic – Clinical audiometer – with integrated thermal printer
10299: Piano model Basic VRA – Clinical audiometer – with VRA exam
10148: Piano model Plus – Clinical audiometer
10165: Piano model Plus – Clinical audiometer – with integrated thermal printer
10300: Piano model Plus VRA – Clinical audiometer – with VRA exam
10306: Piano model Plus VRA - Clinical audiometer with VRA exam - with integrated thermal printer

Included parts
- TDH-39 supra-aural headphones
- HDA-200 headphones (only Plus)
- B71 bone vibrator
- Patient response switch
- Monitor headset with boom microphone
- Clip-on microphone for patient-to-operator communication
- Plastic cover sheet
- Medical grade power supply
- USB connection cable
- User manual
- Utility CD
- Desktop response switch for children (only Plus VRA)
Optional accessories (with order code)
- 10166: ER-3A insert earphones
- 10172: ER-5A insert earphones
- 10177: IME-100 insert masking earphone
- 10181: Desktop, battery operated microphone for live speech tests
- 10179: Amplivox Audiocups noise excluding enclosures for TDH-39 headphones
- 10257: Additional patient response switch
- 10180: Cable set for sound booth
- 10182: Soft carrying case
- 10149: Daisy / Noah Maestro module
- 10293: Thermal paper for Harp and Piano audiometers (box of 5)
- 10266: One active speaker FBT Jolly 5RA
- 10259: One active speaker FBT Jolly 8BA

Only for Piano Plus VRA
- 10301: Visual Reinforcement for Piano VRA – Kit The Bunny
- 10302: Visual Reinforcement for Piano VRA – Peanuts the Dog
- 10303: Visual Reinforcement for Piano VRA – Jack the Donkey
- 10053: Dedicated table for Pediatric Audiometry systems
- 10307: Stand for toy and speaker
- 10304: Daisy VRA module
- 10308: Pre-configured mini-tower computer with 4 video outputs - includes the webcam