



# Piano Basic – Plus – Plus VRA

CLINICAL AUDIOMETER

### 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

IEC 60645-1: Type 1 Class A/AE  
 ANSI S3.6: Type 1A/1AE  
 IEC 60645-1 / ANSI S3.6: EHF (Extended High Frequency) Compliant (Piano Plus / Plus VRA only)

### 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: NBN, WN, SN

### SIGNALS SPECIFICATION

Attenuator step: 1 and 5 dB  
 Presentation: Continuous, Pulsed (0.5, 1 and 2 Hz or custom freq.), Single Pulse (with selectable duration)  
 Warble: 5 Hz sin wave modulating signal

### AVAILABLE OUTPUTS AND TRANSDUCERS

AC: TDH-39 or DD45 headphones, ER-3 insert earphones, HDA-300 headphones (Piano Plus / Plus VRA only)  
 BC: B-71 bone vibrator  
 Free field  
 Insert masking earphone: IME-100

### AVAILABLE TESTS

- Pure Tone audiometry
- Auto threshold (modified Hughson-Westlake)
- Speech audiometry (2 channels)
- ABLB
- MLB
- SISI: automatic score; 1 dB increment (5 dB for familiarization)
- DLI, with increments between 0 and 5 dB
- Tone decay, with 60 or 120 sec. duration
- Stenger, with pure tone or speech stimulation
- 2 independent channels Master Hearing Aid
- TEN test
- QuickSIN® test (optional)

Only on Piano Plus:

- 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

### PURE TONE: FREQUENCIES AND MAXIMUM LEVELS (dB HL)

Freq. (Hz)	AC TDH-39 DD45	AC HDA-200(*) HDA-300	AC ER-3	AC ER-5(*)	BC	FF (**)
125	80	85	90	90	-	75
250	100	100	105	100	45	85
500	120	110	110	110	65	95
750	120	110	115	120	70	95
1.000	120	110	120	120	75	95
1.500	120	110	120	120	80	95
2.000	120	110	120	115	80	95
3.000	120	110	120	115	75	95
4.000	120	105	110	110	75	95
6.000	110	100	100	100	55	90
8.000	100	90	90	90	50	85
9.000	-	90	-	-	-	80
10.000	-	90	-	-	-	80
11.200	-	90	-	-	-	80
12.500	-	80	-	-	-	80
14.000	-	70	-	-	-	80
16.000	-	50	-	-	-	50
18.000	-	110 dB SPL	-	-	-	-
20.000	-	110 dB SPL	-	-	-	-

(\*) Transducer supported but no more available for purchasing  
 (\*\*) 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)

AC (*) TDH-39 DD45	AC HDA-200 HDA-300	AC ER-3	AC ER-5	BC	FF
100	90	100	100	60	Normal: 75 Extended: 85

(\*) Reduce by 20dB in case of free field equivalent filter activation.

### PATIENT –OPERATOR COMMUNICATION

Talk over: built-in or external microphone  
 Talk back: through built-in speaker or monitor headset (included); clip-on patient microphone included  
 Up to 2 patient response buttons (left and right)

### MONITOR SIGNAL

Both channels and patient voice monitored through the built-in speaker or monitor headset (included)

### ASSISTANT MONITOR

Available only on Piano VRA version:

The Assistant monitor headphone is used for the operator to assistant communication.

### PRINTER

Optional integrated thermal printer. Paper size: 112 mm

### INTERNAL FLASH MEMORY

Used to store the speech material (.wav format)

Capacity: 4 GB (more than 6 hours of speech)

Speech material upload: through ATIT software (incl.)

### CALIBRATION

Validity: 12 months.

All the parameters set through the device software

### COMPUTER INTERFACE

Connection: USB (driverless)

Compatible software: Inventis Maestro

### HYBRID TECHNOLOGY

Description: Piano can be controlled either as a stand-alone or as a PC-controlled audiometer

It requires Inventis Maestro software.

### DISPLAY

Type: Graphical colour TFT LCD. Size: diagonal 7", 150 mm x 90 mm

Resolution: 800 x 480. Resistive touch screen

### POWER SUPPLY

External medical grade power supply.

AC consumption: 100-240Vac 47-63Hz 0.9-0.34A

DC output: 6V, 4,16A cont.

### MECHANICS

*Without integrated printer:*

Size (WxDxH): 32 x 32 x 15 cm / 12.6 x 12.6 x 5.9 in

Weight: 2 Kg / 4.4 lbs

*With integrated printer:*

Size (WxDxH): 32 x 39 x 15 cm / 12.6 x 15.4 x 5.9 in

Weight: 2.5 Kg / 5.5 lbs

### 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 / 9.7 lbs

Gross weight (with printer): 4.9 Kg / 10.8 lbs

### APPLICABLE STANDARDS

Pure tone audiometry: IEC 60645-1, ANSI S3.6

Speech audiometry: IEC 60645-1, ANSI S3.6

High Frequency audiometry: IEC 60645-1, ANSI S3.6

Calibration: ISO 389-1 (TDH 39 and DD45), ISO 389-2 (ER-3 and ER-5), ISO 389-3 (B71), ISO 389-5 (HF), ISO 389-7 (FF), data from the manufacturer (HDA-300 headphones)

Electrical safety: IEC 60601-1, Class I type BF

EMC: IEC 60601-1-2

### CE CERTIFICATE

93/42/EEC classification : Class IIa

Classification rule (Annex IX, 93/42/EEC): 10

Notified body: TÜV SÜD Product Service GmbH (0123)

### PRODUCT CODES

10147: Piano model Basic – Clinical audiometer

10164: Piano model Basic – Clinical audiometer – with integrated thermal printer

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 or DD45 supra-aural headphones
- HDA-300 headphones (Piano Plus / Plus VRA only)
- 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
- Desktop response switch for children (Piano Plus VRA only)
- Integrated thermal printer (Printer versions only)

### OPTIONAL ACCESSORIES (with order code)

- 10833: ER-3C insert earphones
- 10177: IME-100 insert masking earphone
- 10181: Desktop, battery operated microphone for live speech tests
- 10266: One active speaker FBT J-5A

### OTHER OPTIONAL PARTS (with order code)

- 10179: Amplivox Audiocups noise excluding enclosures for TDH-39 / DD45 headphones
- 10180: Cable set for sound booth
- 10182: Soft carrying case
- 10257: Additional patient response switch
- 10293: Thermal paper for Harp and Piano audiometers (box of 5)
- 10533: QuickSIN® test license

Only for Piano Plus VRA:

- 10302: Visual Reinforcement for Piano VRA – Toy Type 1
- 10303: Visual Reinforcement for Piano VRA – Toy Type 2
- 10053: Dedicated table for Pediatric Audiometry systems
- 10307: Stand for toy and speaker
- 10308: Pre-configured mini-tower computer with 4 video outputs - includes the webcam

Piano is developed by Inventis s.r.l.

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The Inventis Quality System complies with ISO 13485 standard.