



# Flute Basic – Plus – HF

DIAGNOSTIC MIDDLE EAR ANALYZER



### CLASSIFICATION

Flute is a diagnostic middle ear analyzer, capable of performing incredibly fast and reliable automatic sequences of tympanometry and reflex threshold tests.

### CLASSIFICATION

IEC 60645-5 / ANSI S3.39: Type 2

### PROBE TONE

Frequency: 226 Hz  
 1000 Hz (Flute Plus w/optional license and Flute HF)  
 Level: 85 dB SPL (@ 226 Hz)  
 75 dB SPL (@ 1000 Hz)

### COMPLIANCE MEASUREMENT SYSTEM

Volume range: .0.2 ÷ 8.0 ml (@ 226 Hz)  
 0.9 ÷ 15 mmho (@ 1000 Hz)

### PRESSURE SYSTEM

Rotary type pump with endless flow  
 Manual pressure adjustment available in the tympanometry and reflex tests (Flute Plus only)

### AVAILABLE TESTS

- Tympanometry (automatic)
  - Acoustic Reflex Threshold (automatic)
  - 2 Automatic test sequences (tympanometry + reflex test)
- Only Flute Plus
- Tympanometry (manual)
  - Acoustic Reflex Threshold (manual)
  - Acoustic Reflex Decay
  - Eustachian Tube Function (intact TM)
- Only Flute HF
- Eustachian Tube Function (intact and perforated TM)

### TYMPANOMETRY

Viewing mode: absolute or compensated  
 Single scan  
 User selectable pressure range  
 Maximum range: -600 to +400 daPa  
 Safety limits: -800 daPa and +600 daPa  
 Available rates: 50, 100, 200, 300 daPa/sec and AUTO (100-300 daPa/sec)  
 Manual pressure adjustment (Flute Plus only)  
 Auto start feature

### ACOUSTIC REFLEX TEST

Ipsilateral and contralateral stimulation  
 Non-acoustic stimulation (Flute Plus only)  
 Stimulus ON-Time: selectable from 0.5s to 2.5s  
 Stimulus OFF-Time: selectable from 0.5s to 2.5s  
 Four different tests available:

- Automatic threshold
- Fixed intensity
- Growing intensity
- Manual mode (Flute Plus only)

### ACOUSTIC REFLEX DECAY TEST (FLUTE PLUS ONLY)

Ipsilateral and contralateral stimulation  
 Non-acoustic stimulation  
 Test duration: 10 sec or 20 sec (selectable)

### EUSTACHIAN TUBE FUNCTION TEST

ETF with TM intact: Williams test  
 ETF with perforated TM: Toynbee test, with customizable duration and pressure range

### QUICK TESTS

Two user programmable Quick tests available  
 Each test consists of a sequence of

- Tympanometry
- Reflex test (Fixed intensity or Automatic threshold, with user defined parameters)

### AVAILABLE STIMULI AND MAXIMUM LEVELS

Attenuator step: 5 dB

Stimulus	IPSI (dB HL)	CONTRA TDH39/DD45 headphone (dB HL)	CONTRA IME-100 earphone (dB HL)
250 Hz	-	100	-
500 Hz	100	120	110
1,000 Hz	110	120	115
2,000 Hz	105	120	110
3,000 Hz*	105	120	110
4,000 Hz	100	120	110
6,000 Hz*	100	105	100
8,000 Hz*	-	100	-
BBN*	95	115	105
LPN*	95	115	105
HPN*	95	115	105

(\*) available only on Flute Plus model

### 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 Maestro

### DISPLAY

Type: Graphical color TFT LCD  
 Size: diagonal 4.3", 95 mm x 54 mm  
 Resolution: 480 x 272

**POWER SUPPLY**

*Without integrated printer:*

- Main Unit: 6Vdc, 1.2A
- External adapter: 100-240 Vac 50/60 Hz 0.9-0.34A medical grade, responding to IEC 60601-1 standard

*With integrated printer:*

- Main Unit: 6Vdc, 3.2A
- External adapter: 100-240 Vac 50/60 Hz 0.9-0.34A medical grade, responding to IEC 60601-1 standard

**MECHANICS**

*Without integrated printer:*

- Size (WxDxH): 32 x 32 x 9 cm / 12.6 x 12.6 x 3.5 in
- Weight: 1.9 Kg / 4.19 lbs

*With integrated printer:*

- Size (WxDxH): 32 x 39 x 9 cm / 12.6 x 15.4 x 3.5 in
- Weight: 2.4 Kg / 5.29lbs

**FREIGHT PACKING**

- Size (WxDxH): 47 x 42 x 35 cm / 18.5 x 15.8 x 13.8 in
- Gross weight (without printer): 4.3 Kg / 9.48 lbs
- Gross weight (with printer): 4.8 Kg / 10.58 lbs

**APPLICABLE STANDARDS**

- Impedance: IEC 60645-5 / ANSI S3.39
- Calibration: ISO 389-2 (IPSI), ISO 389-1 (CONTRA TDH 39, CONTRA DD45)
- ISO 389-2 (CONTRA IME-100)
- Electrical safety: IEC 60601-1
- EMC: IEC 60601-1-2

**CE CERTIFICATE**

- MDR 2017/745/EU Classification: Class IIa
- Classification rule (Annex VIII, 2017/745): 10
- Notified body: TÜV SÜD Product Service GmbH (0123)

**PRODUCT CODES**

- 10337: Flute model Basic
- 10338: Flute model Basic – with integrated thermal printer
- 10340: Flute model Plus
- 10341: Flute model Plus – with integrated thermal printer
- 10409: Flute model HF
- 10410: Flute model HF – with integrated thermal printer

**INCLUDED PARTS**

- Main unit
- Control box with probe
- Shoulder strap for probe control box
- Wrist strap for probe control box
- Single TDH-39 contralateral headset or single DD45 contralateral headset or insert contralateral earphone
- Calibration cavities
- Assorted ear tips box
- 3pcs heat-sensitive paper rolls (only for models with printer)
- Plastic cover sheet
- Medical grade power supply
- USB connection cable
- User manual

The Inventis Quality System complies with ISO 13485 standard.

**OPTIONAL PARTS (with order code)**

- 10342: Insert earphone for contra reflex testing
- 10182: Soft carrying case for audiometers/typanometers
- 10864: 1KHz Probe tone license for Flute Plus
- 11672: Handheld support for Inventis tympanometers probe

**DISPOSABLES (with order code)**

- 10293: Thermal paper for printer (box of 5)
- 10488: White tips (diam. 6 mm) – Set of 30
- 10489: Pink tips (diam. 7 mm) – Set of 30
- 10490: Violet tips (diam. 8 mm) – Set of 30
- 10491: Green tips (diam. 10 mm) – Set of 30
- 10492: Red tips (diam. 12 mm) – Set of 30
- 10493: Blue tips (diam. 14 mm) – Set of 30
- 10494: Orange tips (diam. 16 mm) – Set of 30
- 10495: Light blue tips (diam. 18 mm) – Set of 30
- 10496: Yellow tips (diam. 21 mm) – Set of 30
- 10511: Box with assorted tips – Set of 160
- 10554: Cleaning brushes for the tympanometers probe

**SUMMARY**

	Flute Basic	Flute Plus	Flute HF
Automatic tympanometry	✓	✓	✓
Manual tympanometry	-	✓	-
Reflex test			
<i>Fixed intensity</i>	✓	✓	✓
<i>Growing intensity</i>	✓	✓	✓
<i>Automatic threshold</i>	✓	✓	✓
<i>Manual</i>	-	✓	-
Acoustic reflex decay	-	✓	-
Quick tests (tymp. + reflex seq.)	✓	✓	✓
ETF			
<i>TM intact</i>	-	✓	✓
<i>TM perforated</i>	-	-	✓
Probe tones	226 Hz	226 Hz 1000 Hz[*]	226 Hz 1000 Hz

[\*] Available through optional activation license

Flute is manufactured by:

**INVENTIS S.r.l.**

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