



# AUDIOMETRY TYMPANOMETRY COMBINED



GSI 39

# THE PERFECT FIT FOR HEARING SCREENING

## **GSI 39** AUDIOMETRY AND TYMPANOMETRY

The GSI 39™ is a flexible screening product for tympanometry, acoustic reflex measurements, and audiometry to meet your testing needs today and in the future. The GSI 39 is available in five different versions. Choose your needed features today and upgrade your device with additional features as your needs change in the future.



## **GSI SUITE OFFERS** REPORTING AND COUNSELING

With one button press, test results are transferred from the GSI 39 to GSI Suite software where audiometric, tympanometric, and OAE test results may be combined into a single comprehensive report. Counseling overlays such as the speech banana or hearing loss levels assist the clinician with explaining the results to the patient and family members.





gsl

gsl G1.2P Auto Dyno

# KEY FEATURES

## **MULTIPLE PROBE TONES**

Probe tones of 226 Hz and 1000 Hz are available. Normative ranges for middle ear pressure and admittance are included.

## **SCREENING AUDIOMETRY**

Air conduction screening from 125 to 8000 Hz. Steady, Pulsed, and FM provide a variety of interesting test stimuli to accommodate all screening environments.

## **5 AVAILABLE VERSIONS**

Flexible options that include tympanometry at 226 Hz, 1000 Hz, ipsilateral and contralateral reflex screening, and audiometry in any combination.

## **IPSI AND CONTRA REFLEX SCREENING**

Quickly screen for the presence of ipsilateral or contralateral acoustic reflexes at up to four frequencies.

## **STAND-ALONE PC ENABLED**

Have the reliability of a stand-alone device with the ability to be EMR/EHR compatible. A single button press transfers tympanometric and audiologic data for advanced reporting options.

## **PRINTING OPTIONS**

Use the on-board printer or connect to GSI Suite to print results.



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## 3 KEY BENEFITS

### ✓ **MULTIPLE CONFIGURATIONS**

Accommodate a variety of testing needs with five versions. Combine tympanometry, ipsi and contra reflex screening, and screening audiometry to quickly assess middle ear function, neural integrity, and hearing level in patients of all ages.

### ✓ **RELIABILITY YOU CAN TRUST**

GSI has a history of manufacturing products that are designed for durability. Enjoy the flexibility of a portable, stand-alone device with an internal printer or connect to a PC for seamless EMR/EHR transfer.

### ✓ **TESTING TAKES SECONDS**

As soon as the probe tip obtains a seal in the ear canal, the tympanogram will automatically begin. Pressure sweep is 600/200 daPa per second, which provides a fast and accurate picture of the middle ear function.

# AUDIOMETRY AND TYMPANOMETRY COMBINED

## TECHNICAL SPECIFICATIONS

### DIMENSIONS AND WEIGHT

**W x D x H:** 12.5 in x 14.5 in x 4.7 in  
(31.75 cm x 36.83 cm x 11.94 cm)

**Weight:** 5 lb – unit and probe (2.27 kg)

**Shipping W x D x H:** 19.5 in x 22.5 in x 8.25 in  
(49.53 cm x 8.86 cm x 20.96 cm)

**Shipping Weight:** 13.1 lb (5.94 kg)

### GS1 39 PROBE – 226 HZ PROBE TONE ONLY

#### TYMPANOMETRY AND REFLEX MODES

##### PROBE TONE

**Frequency:** 226 Hz  $\pm$  2%

**Intensity:** 85.5 dB SPL  $\pm$  2.0 dB

**Harmonic Distortion:** < 3%

##### COMPLIANCE

**Range:** 0.0 to 1.5 cm<sup>3</sup> and 0.0 to 3.0 cm<sup>3</sup>

**Accuracy:**  $\pm$  5% or  $\pm$  0.1 cm<sup>3</sup>, whichever is greater

##### PRESSURE

**Range:** +200 to -400 daPa

**Accuracy:**  $\pm$  10 daPa or 15%, whichever is greater, measured in 0.5 to 2.0 cc cavities

**Sweep Rate:** 600 daPa/sec, except near tympanogram peak where sweep rate slows to 200 daPa/sec to provide better definition of the peak compliance

**Sweep Direction:** Positive to negative

**Gradient:** Tympanometry pressure width at 50% of peak compliance

**Test Time:** Approximately 1 second

##### REFLEX

**Frequencies:** 500, 1000, 2000, and 4000 Hz

**Accuracy:**  $\pm$  3%

**Total Harmonic Distortion:** < 5% (< 10% at 110 dB HL)

**Rise/ Fall Times:** 5 to 10 msec

**Output Levels:** 80 - 110 dB HL

**Pressure:** Automatically set to pressure at peak compliance with an offset of + or - 20 daPa depending on location of peak compliance

**Test Time:** 2 to 12 seconds

### COMBO PROBE – 226 HZ AND 1 KHZ PROBE TONES

#### TYMPANOMETRY AND REFLEX MODES

##### 226 HZ PROBE TONE

**Frequency:** 226 Hz, 1000 Hz  $\pm$  2%

**Intensity:** 85.5 dB SPL  $\pm$  2.0 dB

**Harmonic Distortion:** < 3%

##### 1 KHZ PROBE TONE

**Frequency:** 1 kHz  $\pm$  2%

**Intensity:** 75 dB SPL  $\pm$  2.0 dB

**Harmonic Distortion:** < 3%

##### COMPLIANCE (226 HZ)

**Range:** 0.0 to 1.5 cm<sup>3</sup> and 0.0 to 3.0 cm<sup>3</sup>

**Accuracy:**  $\pm$  5% or  $\pm$  0.1 cm<sup>3</sup>, whichever is greater

##### ADMITTANCE (1 KHZ ONLY)

**Range:** 0.0 to 5.0 mmho and 0.0 to 10.0 mmho

**Accuracy:**  $\pm$  5% or  $\pm$  0.3 mmho, whichever is greater

##### PRESSURE

**Range:** +200 to -400 daPa

**Accuracy:**  $\pm$  10 daPa or 15%, whichever is greater, measured in 0.5 to 2.0 cc cavities

**Sweep Rate:** 600 daPa/sec slowing to 200 daPa/sec near tympanometry peak - 226 Hz only; 200 daPa/sec - 1 kHz only

**Sweep Direction:** Positive to negative

**Gradient:** Tympanometry pressure width at 50% of peak compliance (226 Hz only)

**Test Time:** 1 to 3 seconds

##### REFLEX (226 HZ PROBE TONE)

**Frequencies:** 500, 1000, 2000, and 4000 Hz

**Accuracy:**  $\pm$  3%

**Total Harmonic Distortion:** <5% (<10% at 110 dB HL)

**Rise/Fall Times:** 5 to 10 msec

**Output Levels:** 80-110 dB HL

**Step Size:** 10 dB

**Pressure:** Automatically set to pressure at peak compliance with an offset of + or - 20 daPa depending on location of peak compliance

**Test Time:** 2 to 12 seconds

##### REFLEX (1 KHZ PROBE TONE)

**Frequencies:** 500, 2000, and 4000 Hz

**Accuracy:**  $\pm$  3%

**Total Harmonic Distortion:** <5%

**Rise/Fall Times:** 5 to 10 msec

**Output Levels:** 80-100 dB HL

**Step Size:** 10 dB

**Pressure:** Automatically set to ambient pressure (0 daPa) for all tests

### AUDIOMETRY MODE

#### FREQUENCIES

125, 250, 500, 750, 1000, 1500, 2000, 3000, 4000, 6000, and 8000 Hz

**Accuracy:**  $\pm$  2%

**Total Harmonic Distortion:** < 2.5%

**Rise/Fall Time:** 20 to 50 msec

#### HEARING LEVEL RANGE

**Air Conduction:** -10 to 100 dB HL

**Step size:** 5 dB

**Accuracy:**

• 125 to 4000 Hz  $\pm$  3 dB

• 6000 to 8000 Hz  $\pm$  5 dB

**Signal to noise:** > 70 dB

#### TONE PRESENTATION:

**Continuous:** Steady on when Present bar is depressed

**Pulsed:** 2.5/ sec ( 200 msec ON, 200 msec OFF)

**FM (frequency modulated or warble tone):**  
 $\pm$  5%, 5 Hz

### PRINTER

4 inch thermal printer

**Speed:** 2 audiograms + 2 tymp/reflex (4 frequencies), < 1 minute

### DISPLAY

240 x 64 graphical, monochrome LCD

### STANDARD ACCESSORIES

Probe assembly (Standard - 226 Hz only or Combo - 226 Hz and 1 kHz)

Power module + power cord

Test cavity

Eartips

Printer Paper

User manual

Quick reference guide wall chart - 226 Hz

Contra phone; versions 2 and 3

DD 45 headset; versions 3 and 4

GS1 Suite

### ENVIRONMENTAL

**Operating Temperature:** +59° F (15° C) to +104° F (40° C)

**Storage Temperature:** -93° F (-69° C) to +149° F (65° C)

**Operating Humidity:** 15% to 95%

**Operating Ambient Pressure:** 98 kPa to 104 kPa

### POWER

**Universal, auto-ranging power supply:** 100 to 240V  $\pm$  10%; 50 to 60 Hz  $\pm$  5 %; 16 W maximum while printing

### QUALITY SYSTEM

Manufactured, designed, developed and marketed under ISO 13485 certified quality systems.

### COMPLIANCE

#### TYMPANOMETRY AND REFLEX MODES

##### PROBE TONE

• IEC/EN 60601-1 Medical Electrical Equipment Requirements for Safety

• CSA C22.2 No.601-1-M90

• ANSI S3.39 Aural Acoustic Impedance Admittance (Type 3)

• IEC 60645-5 Aural Acoustic Impedance/ Admittance (Type 3)

• ANSI S3.6 Audiometers (Type 4)

• IEC 60645-1 Pure Tone Audiometers (Type 4) Specifications for Audiometers (Type 4)

• PTB Certificate No. 15.11-94/53 Pure Tone Audiometers (Type 4)

• GL2005-00014 Guidelines for Manual Pure-Tone Threshold Audiometry