

<b>Standards and Compliance</b>	Standards	UL 60601-1 Medical Electrical Equipment Requirements for Safety; IEC/EN 60601-1 General Requirements for Safety; CSA C22.2 No. 601-1-M90; ANSI S3.39-1987 Aural Acoustic Impedance Admittance (Type 3); IEC 60645-5 Aural Acoustic Impedance/Admittance (Type 2); ANSI S3.6-2004 Audiometers (Type 4); IEC 60645-1 Pure Tone Audiometers (Type 4); GL2005-00014 (ASHA 2005) Guidelines for Manual Pure-Tone Threshold Audiometry
<b>Tympanometry Mode</b>	Probe Tone	226 Hz, ± 2%
	Sound Pressure Level	226 Hz: 85.5 dB SPL, ± 2.0 dB, measured in a 2.0 cm <sup>3</sup> coupler
	Harmonic Distortion	< 3%
	Admittance (Compliance) Range	226 Hz: 0.0 to 1.5 cm <sup>3</sup> or 0.0 to 3.0 cm <sup>3</sup>
	Pressure Range	+200 to -400 daPa
	Pressure Accuracy	± 10 daPa or ± 15%, whichever is greater
	Rate of Sweep	600 daPa/sec except near tympanogram peak where sweep rate slows to 200 daPa/sec to provide better definition of peak compliance
	Direction of Sweep	Positive to negative
	Tympanogram Test Time	Approximately 1 second
<b>Reflex Mode</b>	Frequencies	500, 1000, 2000, and 4000 Hz for ipsilateral stimulation
	Accuracy	± 3%
	Total Harmonic Distortion	< 5% for outputs less than 110 dB HL and < 10% at 110 dB HL
	Rise/Fall Time	5 to 10 msec
	Output Levels	Ipsilateral: 500 and 4000 Hz: 80, 90, 100 dB HL; 1000 and 2000 Hz: 85, 95, 105 dB HL
	Pressure	Reflex measures are set automatically to pressure at peak compliance with an offset of -20 daPa if peak pressure is negative and +20 daPa if peak pressure is positive.
	Reflex Determination	Compliance change of 0.05 cm <sup>3</sup> or greater
	Reflex Test Time	1 to 12 seconds depending upon the number of ipsilateral test frequencies selected (4 maximum) and intensity required
<b>Audiometry Mode</b>	Frequencies	125, 250, 500, 750, 1000, 1500, 2000, 3000, 4000, 6000, 8000 Hz
	Accuracy	± 2%
	Total Harmonic Distortion	< 2.5% (125 to 3000 Hz measured acoustically at maximum dB HL; 4000 and 6000 Hz measured electrically)
	Audiometric Headset	Pair External earphones Type 51 cushions (60 ohms impedance). Headband force per ANSI S3.6 and IEC 645 (4.5 N ± 0.5)
	External Headset Earphones	125 Hz: -10 to 50 dB HL; 500 to 4000 Hz: -10 to 90 dB HL; 6000 Hz: -10 to 85 dB HL; 250 and 8000 Hz: -10 to 70 dB HL
	Accuracy	125 to 4000 Hz ± 3 dB; 6000 and 8000 Hz ± 5 dB
	Step Size	5 dB
	Signal-to-Noise Ratio	> 70 dB in 1/3 octave; less than -10 dB HL for levels less than 60 dB HL
	Rise/Fall Time	20 to 50 msec
	Continuous	Tone is steady when present bar is depressed
	Pulsed	Tone is pulsed at 2.5/sec (i.e., 200 msec ON, 200 msec OFF)
FM (frequency modulated)	Tone is frequency modulated at a rate of 5 Hz, ± 5%	
<b>Power</b>	Line Voltage	100 - 240 VAC (± 10%)
	Power Consumption	16 watts maximum while printing. Low-voltage input for desktop power supplies 7 VDC, 5.0 A
<b>Mechanical</b>	Instrument	Dimensions: 12.5" W x 14.5" D x 4.7" H (31.8 cm W x 36.8 cm D x 11.9 cm H); Weight: 5 lbs (2.3 kg)—unit and probe
	Shipping Carton	Dimensions: 19.5" W x 22.5" D x 8.25" H (49.5 cm W x 57.2 cm D x 20.9 cm H); Weight: 13.1 lbs (6 kg)



Audiometry, Tympanometry and Acoustic Reflex

Welch Allyn TM 286™ AutoTymp®

**Ordering Information**

TM 286 AutoTymp .....	28600	Audiometry Audio Cups .....	23222	TM Eartips 13 mm (box of 25) .....	26013
TM 286 Carrying Case .....	05260-U	TM 286 Printer Paper, 4" Thermal, 1 pkg of 5 rolls ..	52600	TM Eartips 15 mm (box of 25) .....	26015
Audiometry Patient Response Switch .....	23220	TM Eartips (6 sizes, 2 each) .....	26100	TM Eartips 17 mm (box of 25) .....	26017
Audiometry Single Patch Cord, 2-Conductor .....	23221	TM Eartips 8 mm (box of 25) .....	26008	TM Eartips 19 mm (box of 25) .....	26019
		TM Eartips 11 mm (box of 25) .....	26011		

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# TM 286 AutoTym<sup>®</sup>

Pure Tone & Tympanometry Screener



The Welch Allyn TM 286 AutoTym<sup>®</sup> provides flexible screening for tympanometry, acoustic reflex measurements and audiometry to meet your testing needs today and in the future.

The TM 286 AutoTym is lightweight and portable. It is designed to make detection and documentation of middle ear pathologies fast and accurate.

## Tympanometry: 226 Hz

- Ear Canal Volume (ECV)
- Compliance Peak (cm<sup>3</sup>)
- Pressure at peak of the tympanogram (daPa)
- Gradient (GR) in daPa (width of the tympanogram)

The tympanograms and summary information are clearly shown on the crisp LCD once the test is complete. LEDs on the probe guide the tester through the test sequence. All test results can be printed on the internal printer. The ASHA normal box can be shown as a guide on the display and printouts, if desired. A hand-held probe is provided with versions providing 226 Hz only measurements.

## Tymp and Reflex

Ipsilateral reflex measurements may be performed along with 226 Hz tympanometry. The frequencies available are 500, 1000, 2000 and 4000 Hz. All reflex results may be displayed and printed as:

- Reflex tracings and dB HL values
- dB HL values only
- Yes/No response

Any combination of ipsi reflex measurements up to a maximum of four frequencies may be selected.



## Audiometry

Both manual and automated audiometry are available with the TM 286. During manual audiometry, the operator controls the selection of frequencies, signal format (steady, pulsed and FM), intensity, tone presentation and identification of the hearing threshold values per frequency tested. For automated audiometry, the test protocol is selected in the Program mode and includes frequencies to be tested, signal format, intensity range and scoring rules. Once the test begins, the test sequence is controlled by the TM 286 based upon the operation of the optional hand switch by the person being tested.

Test results are displayed as an audiogram on the LCD as they become available. These results can be printed in a tabular or audiogram format.

The standard headset for audiometry is the TDH 39. However, the EAR 3A or 5A insert phones may be added as an option. It is possible to store the calibration values for both the TDH and insert phones so that a button press selects the transducer and its calibration.



## Memory, Printing and Data Transfer

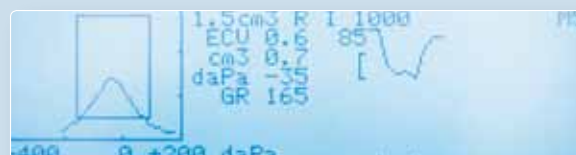
A maximum of 12 test results can be stored in the TM 286 memory for review and selection for printout.

A built-in printer is available; it provides the ability to obtain hard copies of all test results. Alternatively, the test results can be sent to an optional external printer via the built-in USB port. An external inkjet printer which recognizes the PCL3 or PCL3GUI language format can be selected.

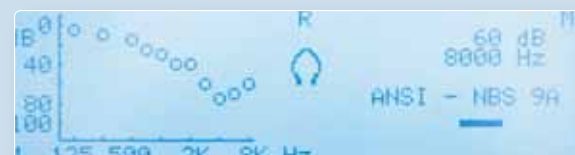
Test results may also be transferred to an external computer for data storage via the second built-in USB port.



## Setting the Clinical Standard



Sample 226 Hz Tym



Sample Manual Audiogram result