

# AT235/AT235h

*Middle Ear Analyzers*



*Fast and reliable*



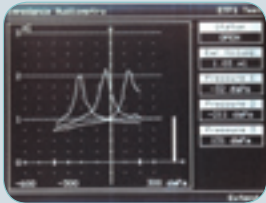
**Interacoustics®**

leading diagnostic solutions

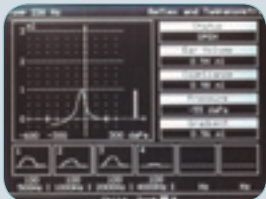
# AT235/AT235h

## Middle Ear Analyzers

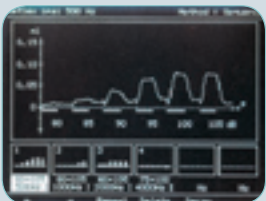
### Fast and reliable



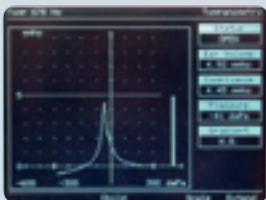
Automated Eustachian Tube Function test is available



Tympanogram and reflex test results displayed simultaneously



A group of increasing stimuli for reflex testing, clear displays reflex growth with increasing intensity



High frequency screening tympanometry records the IYI tympanogram

The AT235 is an automatic middle ear analyzer ideal for diagnostic and screening evaluations. The primary design of the AT235 emphasizes ease of use without compromising testing flexibility. Test batteries of the AT235 include standard tympanometry, ipsilateral and contralateral acoustic reflex and reflex decay, Eustachian tube function test and air conduction audiometry.

Automated tympanometry may be combined with 2 programmable reflex test batteries. Further manual reflex testing is available for more tests or to confirm/modify automated reflex results. The AT235 allows 78 reflex tests per ear to be stored and printed. These capabilities provide the necessary tests for the majority of any clinic's needs. The addition of high frequency probe tones to optimize tympanometry testing of infants is available with the AT235h model.

#### Normal tympanometry

Interacoustics utilize two beneficial techniques to acquire tympanograms. The first is an 'endless air-flow' technique which improves the instrument's ability to obtain a tympanogram on difficult to test patients or when a slight leak is present. This prevents the system from continually resetting to continue the test. The second feature is an intelligently controlled pump system with an adaptive speed control. This feature combines a very fast test speed with high resolution of the tympanogram peak which might otherwise be obtained only with a slower pump speed.

#### AT235h - High frequency and manual tympanometry

The AT235h provides additional high-frequency probe tones for Y-component testing in addition to the traditional 226Hz tone. With the push of a single button, the AT235h will switch to a 678, 800 or 1000 Hz probe tone. A tympanogram that is recorded using a high frequency probe tone (e.g. 1000 Hz) is considered more suitable for screening neonates.

In addition to automatic mode, the pump action on the AT235h can be controlled manually. In this mode, pressure increase/decrease is controlled by

keys on the front panel. Pressure speed can be toggled between three speeds.

#### User definable reflex test

Two user programmable acoustic reflex sequences are available allowing the user to define a simple screening procedure for test A and a more in-depth evaluation as test B. These protocols may be programmed and/or selected by the push of a button. The parameters for test A and B come with a factory default setting but are easily changed to better suit alternative clinical test routines. The protocols allow intensity presentations at fixed levels, in auto threshold mode or a defined sequence to display reflex growth. The AT235 and AT235h allow mixing of ipsi and contra reflexes in the protocol as well as a variety of stimuli such as pure tones or noise bands. There are few limitations on storing and printing as 78 reflexes may be recorded per ear. All reflex testing may be done manually in addition to the automated routines.

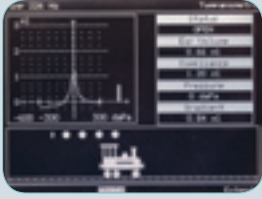
#### Decay - Contra and Ipsi

Acoustic reflex decay testing is available with ipsilateral as well as with contralateral stimulation. The AT235 comes with a standard single TDH39 and a button insert receiver (CIR22) for stimulating the contralateral ear is available as an option.

#### Eustachian tube function

The AT235 performs a single Eustachian Tube Function test suitable for use when the eardrum is intact. Instructions on the display guide the test. Three tympanograms are produced from which the condition of the Eustachian tube can be inferred.

The AT235h has a further ETF test suitable for when the eardrum is perforated.



A moving train may help to keep children quiet during testing.

### Visual child distraction

The AT235 has a selection for a moving “choo choo train” on the screen to help keep the child distracted while running tympanometry tests.

### Probe Systems

The AT235 is supplied with a combi probe system that is easily interchanged for screening and clinical testing purposes. The screening probe tip is ideal for quick tymps and a screening reflex, while the diagnostic probe provides more stability for more lengthy exams that include tymps, reflexes, reflex decay and ETF. The probe has a button for changing ears remotely from the AT235 and for starting and pausing the test.

### Audiometry

A basic air conduction pure tone audiometry function is a standard feature on the AT235 and AT235h. Basic pure tone audiograms may be generated manually or with an automatic HL function. All that is required is the purchase of an optional, independent headset. For patient safety, the maximum output may be limited.

### Printing Options

A fast thermal printer is built into the instrument. If the data is downloaded to the Interacoustics OtoAccess™ database or NOAH, printouts may be generated through the PC.

### Data Storage with Windows® Based Software

Transferring data to a PC is possible by two different applications. OtoAccess™ is the Interacoustics® database platform that enables data collection from multiple instrument sources into one patient file. Hearing aid information may also be included. NOAH hearing aid fitting software will also integrate the test data when used with the Interacoustics® NOAH impedance module software.



### AT235

- Automatic tympl/reflex sequences & manual reflex
- Ipsi and contra acoustic reflexes
- Intact ETF test
- Reflex Decay

### AT235h also holds

- High Frequency probe tones
- Intact & perforated ETF tests
- Manual tymp test



Detachable probe tip



Shoulder and wrist strip for clinical probe system



**Interacoustics®**

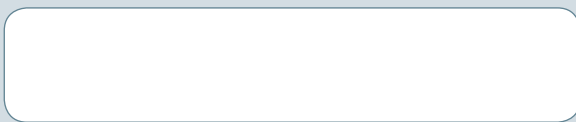
leading diagnostic solutions



# Technical Specifications

<b>Probe tone:</b>	Frequency: 226Hz. AT235h also: 678Hz, 800Hz, 1000Hz for traditional IYI-curve tympanometry. Level: 85 db SPL. Gain Control: AGC.	
<b>Air pressure:</b>	Control: Automatic. Range: Default +200 to -400daPa (max. +300 to -600daPa). Safety limitation: -800 daPa and +600 daPa. Pressure change rate: Selectable in the set-up between 50, 150 and >250 daPa/s or automatic. Compliance: Range: 0.1 to 6.0 ml (numerical: 0.1 to 8.0 ml).	
<b>Function:</b>	Automatic, where pump speed, start and stop pressure can be userprogrammed in the set-up. AT235h: Auto and manual pump functions.	
<b>Eustachian Tube Function:</b>	AT235: Function test for use when the eardrum is intact. AT235h: Function tests for use with both intact and perforated eardrums.	
<b>Acoustic Reflex tests:</b>	Automatic reflex: Two independent user selectable protocols. Series of fixed intensities available. Automated intensity search functions available for threshold search and reflex growth indication. Free mixing of Ipsi and Contra. Manual reflex: Manual control of all stimuli. May also be used to redo part of automated test results. Reflex decay: Manual control, with stimulus duration of 10 sec. Ipsi or contralateral stimulation.	
<b>Frequencies and intensity ranges:</b>	Ipsilateral: Intensity up to 110dBHL. Frequency: 250, 500, 1000, 2000, 3000, 4000, WB, HP, LP noise Contralateral: Intensity up to 120dBHL. Frequency: 125 to 8000Hz, WB, LP, HP noise Audiometry: Intensity from -10 to 120dBHL. Frequency from 125Hz to 8000Hz	
<b>Attenuator:</b>	1dB or 5dB steps.	
<b>Memory:</b>	Internal memory for two ears. Each ear: 6 Ipsi and 6 Contra recordings. Each may have up to 6 stimuli. Also, there is memory for additional manual reflex recordings. (Total max. 78 reflexes per ear).	
<b>Audiometer Functions:</b>	Manual Audiometry. Automatic Audiometry according to ISO 8253-1 (Patient controlled Hughson-Westlake).	
<b>PC Communication:</b>	Input/output for computer communication via USB. One mode allows an external PC to both monitor and control the instrument. The control actions can be followed on the display and operation panel. Online communication, where the measurement data are sent to an external PC can be selected.	
<b>Printer</b>	Built-in fast thermal printer with paper width: 112 mm.	
<b>Compatible Windows software:</b>	Interacoustics OtoAccess™ Database. IA-NOAH-Imp Module for interfacing to NOAH.	
<b>Power Supply:</b>	UPS400 (Included) 100-240V.	
<b>Consumption:</b>	15VA, max. 45VA.	
<b>Dimensions/weight:</b>	(LxWxH): 36x26x10 cm / 14x10x4 inches. Weight: 2.8 kg / 6 lbs.	
<b>Impedance standard:</b>	IEC 60645-5/ANSI S3.39, Type 2.	
<b>Audiometer standard:</b>	IEC 60645-1/ANSI S3.6, Type 4 Tone.	
<b>Safety standard:</b>	IEC 60601-1, Class I, Type B.	
<b>Medical CE-mark:</b>	Yes	
<b>Printer Option:</b>	AT235/AT235h-xp is identical to the AT235/AT235h but has no built-in printer. Suitable for installations where computer connection takes care of printing.	
<b>Included Parts:</b>	ATP-AT235u Universal Probe System with shoulder strap and wrist strap HBZ235u Single Contralateral Headset UPS400 External Switch Mode Power Supply Power Cable (110/220V, please specify)	BET50 Box of 65 assorted Eartips TPR26 3 Rolls of Recording Paper PCR-AT235 Dust Cover Operation manual CD Multilingual CE manual
<b>Optional Parts:</b>	TDH39 Audiometric Headset EAR-Tone5A Insert Phones for Audiometry ACC25 Carrying Case CIR22 Contralateral Insert Phone APS3 Response switch	CAT40 Calibration Unit 0.2-0.5-2.0-5.0 ml IES-2 Impedance Ear Simulator OtoAccess™ Database and diagnostic modules software IA-NOAH-Imp module

**Sales and service in your area:**



**Interacoustics A/S**

Phone: +45 6371 3555 · Fax: +45 6371 3522  
E-mail: info@interacoustics.com  
DK-5610 Assens, Denmark  
Web: www.interacoustics.com

**Other Middle Ear Analyzers:**

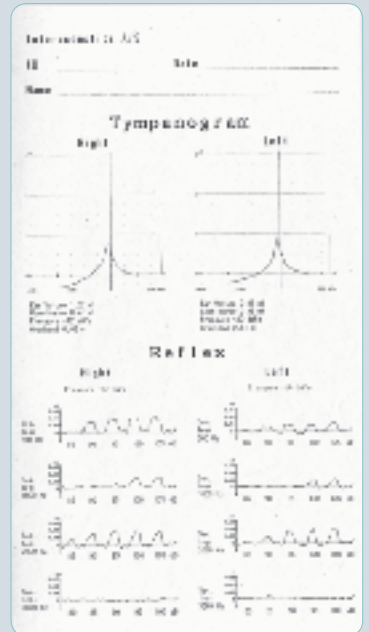
- MT10 Handheld Tympanometer

**Audiometry and Middle Ear Analyzer in one:**

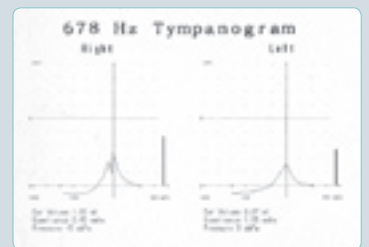
- AA220 Audio Traveller
- AA222 Audio Traveller



Hard shell carrying case



Printout from AT235



Printout from AT235h

**Read more here:**  
[www.interacoustics.com/com/AT235](http://www.interacoustics.com/com/AT235) or [AT235h](http://www.interacoustics.com/com/AT235h)



Leading diagnostic solutions