

HIMSR & HAHC

List of Equipment and Instruments required for ENT Department, HIMSR.

S. No.	Name Of Equipment	Qty
1	Oto endoscope	2
2	Rigid nasal endoscope 0 degree,4mm and 2.7 mm	2
3	Rigid nasal endoscope 30 degree ,4mm and 2.7mm	2
4	Rigid nasal endoscope 70 degree ,4mm and 2.7mm	2
5	Bronchoscopes different sizes for different age group	3
6	Camera & monitor	3 sets
8	ENT Work station for OPD	2
9	Electric drill (motor, headpiece and burrs)	2 sets
10	Operating microscope for major operation theatre	1
11	Temporal Bone Lab	
11.a	Microscope with co observation tube ENT model	1
11.b	Mastoid micro motor drill with straight hand piece	1
12	Brain stem evoked response audiometer – BERA	1
13	OAE - Otoacoustic emission test machine	1
14	Flexible Naso-pharyngo-laryngoscope	1
15	Saw	1
16	Fess set	2
17	Oesophagoscopy set including laryngoscopy	2
18	Full Tonsillectomy and adenoidectomy	2 sets
19	Septoplasty Set	2 sets
20	Tympanoplasty Set	2 sets
21	Mastoidectomy set	2 sets
22	Stapedotomy Set	2 sets
23	Impedance machine (Buy back offer)	1

Annexure: Technical specification of Equipment and Instruments

1. Oto endoscope 0 degree

3mm diameter

Length 14 cm

Should be autoclavable,

Fiber Optic Light transmission incorporated.

Completely distortion free ,

HD optic for better contrast & colour reproduction.

Large field of view & depth of focus

Should be CE&FDA approved Service Centre should be in Delhi/NCR

2. NASAL ENDOSCOPE

a. Straight Forward Telescope 0 degree enlarged view

Size 4mm

Rod lenses system,

Length:14-19 cms,

Should be autoclavable,

Fiber Optic Light transmission incorporated.

Completely distortion free,

HD optic for better contrast & colour reproduction.

Large field of view & depth of focus

Should be CE&FDA approved Service Centre should be in Delhi/NCR

b. Straight Forward Telescope 30 degree enlarged view

Size 4mm

Rod lenses system,

Length:14-19 cms,

Should be autoclavable,

Fiber Optic Light transmission incorporated.

Completely distortion free

HD optic for better contrast & colour reproduction

Large field of view & depth of focus

Should be CE&FDA approved Service Centre should be in Delhi/NCR

c. Straight Forward Endoscope 70 degree enlarged view

Size 4mm Rod lenses system ,

Length:14-19 cms,

Should be autoclavable,

Fiber Optic Light transmission incorporated.

Completely distortion free ,

HD optic for better contrast & colour reproduction.

Large field of view & depth of focus

Should be CE&FDA approved Service Centre should be in Delhi/NCR

3. Rigid Bronchoscope Set

	Qty.
Bronchoscope, length 30 cm, size 4.5	ONE
Bronchoscope, length 30 cm, size 3.5	ONE
Bronchoscope, length 30 cm, size 3	ONE
Bronchoscope, length 30 cm, size 2.5	ONE
Straight Forward Tele- scope 0°, Diameter 2.9 mm, working length 36 cm, auto- clavable. Fiber optic light Transmission incorporated	ONE
Optical Forceps for Pediatric Broncho-Esophagoscoes, with bean jaes, for use with telescope forced controlled handle for removal of peanuts	ONE

and soft foreign bodies

Optical Forceps for use with telescope ONE

Universal, biopsy and grasping.

Forceps, for Peanut & Soft Foreign Bodies, ONE

Double action jaws, sheath diameter 1.5mm

Working length 25cm

Prismatic Light Deflector, Autoclavable, with ONE

Connection to fiber light cable

Glass window Plug ONE

Rubber Telescope Guide for use with ONE

Telescopes or optical forceps

Adaptor with sliding glass window plug, ONE

sealing cap, notched lens and keyhole opening,

moveable.

Adaptor from bronchoscope to respirator ONE

Instrument guide, for suction catheter ONE

Injection Cannula for positive pressure ONE

assisted ventilation system, O.D. 3.5 mm,

with LUER-lock

Injection Cannula for positive pressure ONE

assisted ventilation system, O.D. 2.7 mm,

with LUER-lock

Suction tube, straight, with rubber tip, diameter 2mm ONE

Working length 35cm

4. **Digital Camera: The** system should be truly Digital HDTV endoscopic video camera. The system should have the maximum Resolution of 1920 X 1080 pixels, progressive scan and the consistent use of 16: 9 format for Input & Output to guarantee genuine HDTV.

The system should have Special Features:

- **Visibly Improved Imaging:** CCD sensing chip should optimizes image quality & Digital Source Sampling thus maximizing hi-fidelity image transmission.
- **Optimizes to Any Size: The system should have** Optical Zoom to enhance the quality of Image size & cross specialty standardization of the camera system, regardless of the telescope used.
- **Plug and Go:** The system should automatically optimize all settings. The system should be ready- to- use as soon as it is connected to the camera control unit.
- **Any Head- Any Time:** The system should have the facility to use a single camera control unit for all camera heads (either single chip or three chip) thus minimizing preparation & maximizes inter specialty standardization.
- **Control from sterile Area:** System should have facility of controlling Additional equipments like light source/ insufflators and recording device from the camera head.

Camera system should be compatible with Communication Bus system for remote controlled operation of the various features of the camera along with other equipment. .

Technical Specifications:

Image sensor: 3X1/3'' CCD-Chip.

Pixels 1920 x 1080

AGC: Microprocessor controlled

Lens: Integrated Zoom Lens

Video output: Composite signal to BNC socket.
Y/C signal to S-VHS socket (2 x).
RGB signal to D-sub socket
HDTV signal to DVI-D socket

Input: Keyboard input for character generator. 5-
pole DIN socket.

Control Output/Input

3.5mm Stereo Jack Plug (ACC1, ACC2)

Serial Port at RJ-11

Mains Cord

BNC/BNC Video Cable Length 180 cm

S-Video (Y/C) Connecting Cable Length 180 cm

Special RGB Connecting Cable Length 180 cm

Connecting Cable for controlling peripheral units length 180 cm (2)

DVI-D Connecting Cable Length 300 cm

Keyboard with US English Character

Power Supply:- 100-240 VAC 50/60 Hz

Certified to : IEC 601-1, 601-2-18, CSA 22.2 No. 601, UL 2601 and

CE according to MDD, protection class1/CF

Digital Monitor: FOR HD CAMERA.

Special Features.

- **HDTV LED Display**
- **On Screen menu for monitor setting (possible in several languages)**
- **Liquid crystal display**
- **Max Resolution 1920/1200 Pixles**
- **Anti reflection coated front glass**
- **Easy to access control buttons on the housing front.**

- **Dripwater protected, dustproof housing**
- **Low voltage protection via external 24VDC Mains power supply.**
- **Picture in Picture display (PIP)**
- **Mirror Imaging Possible**
- **Upto 5 different users profiles can be stored**
- **Medical grade FDA, UL and CE Approval.**

Specifications

HD TFT Flat Screen Monitor with stand size 26",

Aspect Ratio 16:10 HD format

Brightness : 500 cd/m²

Max Resolution 1920/1200 Pixels

Maximum viewing angle : 178° vertical

Contrast ratio: 800 : 1

Rated power : 115 watts

Power Supply 100-240 VAC

Screen Dimensions : 627 x 427 x 100mm

Video Inputs : S- Video signal to 4 pol. Mini DIN socket

RGB signal to 5 x BNC socket

Composite to BNC socket

HD-SDI signal to BNC socket

DVI signal to DVI-D socket

SDI signal to BNC socket

Accessories External 24VDC Power Supply, Mains Cord, Pedstal.

Certified to : EN 60601-1, protection class IPX 1

LED LIGHT SOURCE

FEATURES:

- Should have lamp life of More than 25000 hours.
- Quite operation ,no noise during operation
- Should have stand by button with memory function.
- Light intensity display on the front panel.
- Light Intensity control from Feather touch/camera head buttons.
- Ready for OR integration.

Technical Specifications:

- Lamp Type : LED, Watt: 150-175W

- Universal power supply :100-240VAC,50/60HZ
- Operating Temperature : -10 – 40 C
- Light Weight: <5 Kg
- Dimensions : 305* 110*233mm(w*h*d)
- Color temp. of 6400k
- IEC 60601-1-2:2001

Fibre Optic Light Cable.

1

Thickness 3.5mm Length 230 cms

5. ENT work station

1. ENT Treatment unit with patient chair and with work station
 2. Compact design with thermal resistant workshop and auto touch control panes
 3. Large aluminium pull out tray with dividers for keeping various sterile instruments
 4. Containers with flap openings for keeping used instruments and wastes
 5. 2 power sockets 230V should work on 230 V with deviation of 50/60 hz
 6. Should be equipped with, Large LCD monitor connected to an external PC managing Camera System with recording and editing software
 7. Endoscopy counter with telescope 0 degree view 4 mm diameter & 175 mm working length
 8. Suction use counter which should have – Suction hand pieces with tubing capacity 60 Ltrs per minute, vacuum 0.85 bar, receptacle with overflow valve for suction system, suction tip 1 mm, 1.5 mm and 2.5 mm.
 9. Compressed air system with spray hand pieces
 10. Warm water irrigation system
 11. Inline water filter with connectors: Water purification filter (4 weeks life span) to be connected to the hand piece combined to the autonomous system with 5 litre distilled water tank
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12. Ear rinse cap
 13. Pre heated for mirrors
 14. Microscope with minimum 3 step magnification changer and spare bulb
 15. Compatible digital video camera
 16. C mount adopter
 17. Microscope beam splitter with integral endoscope adopter
 18. 17 inch TFT monitor with LCD Flat screen
 19. Integrated fiber optic light source with fiber optic cable for telescope
 20. fiber optic light source 150 W halogen for head light
 21. fiber optic head light with integrated fiber optic cable.
 22. Cautery Power out put- 80W Cautery which should be European CE/US FDA Certified.
 23. doctor stool with – 360 degree ratable adjustable back and height cross type base
 24. patient chair with – electrical height adjustment, arm rest, footrest
 25. flat diagnosis program
 26. should be compatible with future development
 27. protection cover for microscope and work station
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5. Micro drill (Motor , headpiece and burrs):

Surgical micro motor/ drill 50,000 rpm foot and hand control with different special department bur bits.

Straight Hand piece: Straight hand piece with quick toll clamping type of shank @ 2/35, L 70 mm (Two In Number)

Burrs: Cutting 0 to 5 number -one each Polishing 0 to 5 number - one each

Diamond 0 to 5number- one each

6. Surgical Microscope

1. High quality surgical microscope of reputed international make.
2. Floor model, overall approx. dimension: 1730mm x 450/865mm, wheel base 640X640mm or better.
3. Manually variable working distance from 200mm -415 mm (continuously variable) without changing the main objective lens internally.
4. Magnification 5 step manual changer in ration 1:6.
5. All the optical components should be apochromatic corrected for all three basic colors.
6. Straight binocular tube with f=170mm focal length.
7. 12.5x wide field push in magnetic eye pieces
8. Illumination system 12V, 100 W Halogen lamp fully automatic lamp changer with 12V 100W, back up lamp.
9. Spot illumination or full field illumination system
10. Should have lateral hand grips.
11. It should have circuit breaker.
12. All microscope and stand axes with friction brakes
13. For live display and recording, HD Video camera of reputed make along with original beam splitter & C-mount or integrated HD camera should be supplied along with the main unit. It should also be supplied with 32" LED TV.
14. It should have facility of stereo co-observer with straight tube.
15. All wire should be integrated in microscope.
16. It should have facility to upgrade to laser adaptability.
17. It should have comfortable hand grips with removable sterilizable caps.
18. Demo of microscope is required.
19. It should be European CE/ FDA certified

7. Temporal bone lab microscope

Equipment Name	Technical Specification
Temporal bone lab microscope	Operating Microscope wall mounted for OPD Zoom. objective lenses 200, 300, 400 with side tube and integrated HD camera.

	<p>Monitor should also be supplied along with other standard supply and as asked in the specifications.</p> <p>Certificates: USFDA/European CE approved</p>
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. Drill Machine with mastoid set for temporal bone lab

Equipment Name	Technical Specification
<p>Drill Machine with mastoid set for temporal bone lab</p>	<p>International Standards for a High Speed Micro Motor drill for use in ENT</p> <p>High Speed Micro Motor System with motor control display with Hand pieces Straight & Contra angled to be used in Sinus Surgery, Otology, Ethmoid , Mastoid & Temporal Bone surgeries with foot control, integrated irrigation system, speed greater than 50,000 rpm, burrs for special applications Burrs:</p> <p>Cutting 0 to 5 number -1 each Polishing 0 to 5 number – 1 each Diamond 0 to 5number- 1 each</p> <p>Certification : USFDA/European CE approved</p>

8. BERA

CE & FDA Approved with followings tests features:

1. Stimulus level 0 – 100 dB nHL
2. Click stimulus
3. Broadband CE-Chirp & CE-Chirp LS stimuli
- 4 .Narrow Band CE-Chirp & CE-Chirp LS stimuli (0.5, 1, 2, 4 kHz)
5. Tone Burst stimuli (0.25 – 4kHz)
6. Recording window Up to 980 ms

7. Rate Study
8. ECoChG
- 9 .MLR
10. ALR
11. MMN/P300
12. eABR
13. Optional cVEMP / oVEMP / OAE/ ASSR
14. Optional Research module

Hardware Specifications:-

EPA Preamplifier: Two channels standard One Channel (optional)

Frequency response: 0,5 - 5000 Hz

CMR Ratio: Minimum >118 dB. Typical 130 dB < 100 Hz

Radio frequency immunity: Typically 25 dB improvement over previous available designs

Max input offset voltage: 2,5 V

Input impedance: 10 M Ω / 170 pF

Power from main unit: Insulated power supply with 1500 V isolation. The signal is digitally/capacitive insulated.

Impedance measurement: Selectable for each electrode

Measurement frequency: 33 Hz

Waveform: Rectangular

Measurement current: 19 μ A

Range: 0.5 k Ω – 25 k Ω

Stimulus rate: 0.1 to 80.1 stimuli per second in steps of 0.1.

Envelopes/Windows : Bartlett, Blackman, Gaussian, Hamming, Hanning, Rectangle and Manual (Rise/Fall and Plateau)

Masking: White noise. Calibrated and presented in peSPL.

Transducer: Ear Tone ABR insert phone, calibrated on an IEC 711 coupler. Headphone with independent calibration (optional). Bone conductor (optional)

Level: 20 – 135.5 dB peSPL, (-10 – 100 dB nHL) in 1 dB steps.

Polarity: Condensation, Rarefaction, Alternating.

Click: 100 μ s (200Hz -11kHz)

Tone Burst Frequency: 250, 500, 750, 1000, 1500, 2000, 3000, and 4000 Hz.

Tone Burst Stimulation Time: Stimulation up to 780 ms

NB CE-Chirp LS Freq.: 500, 1000, 2000 and 4000 Hz

Broadband CE-Chirp: LS 200Hz -11kHz

Masking Level: +30dB to -40 dB relative to stimulus presented in peSPL.

Recording: Analysis Time: -150 ms prior to stimuli and up to 1050 ms

9. OAE

CE & FDA Approved with followings tests features:-

DP Test Options

(Fixed protocols)

DP 2 to 5 kHz

4 Frequencies tested (3 for pass)

Average test time 15 sec.

SNR 6dB

Custom 2 to 5 kHz

4 Frequencies tested.(3 for pass)

Average test time 10 sec.

SNR 6dB

TE Test Options

1.5 to 4 kHz

6 Frequencies tested (3 for pass)

Average test time 12 sec.

SNR 4dB

Other Features

Portable handheld unit

DPOAE & TEOAE

User programmable protocols

Extended probe available

10. FLEXIBLE NASO-PHARYNGO LARYNGOSCOPE

- 1 Should have a field of view of at least 75°.
- 2 Should have a depth of field from 5 to 50 mm
- 3 The insertion tube should have maximum 3.5mm diameter or less.
- 4 Should have at least 130° upwards and 130° downwards angulations.
- 5 Should have a working length of at least 300 mm.
- 6 Should have a light guide illuminating system.
- 7 Should provide suitable light source.
- 8 Should be supplied with all standard accessories including storage box and list of standard accessories should be specified in the technical bid.

LIGHT SOURCE :

1. Should be a halogen light source with minimum 150W light output with 5 spares.
2. Should have manual light intensity control.
3. Should have cooling system.
4. Should work with input 200 to 240Vac 50 Hz supply.
5. Should have safety certificate from a competent authority CE / FDA (US) / STQC CB certificate / STQC S certificate or valid detailed electrical and functional safety test report from ERTL. Copy of the certificate / test report shall be produced along with the technical bid.

11. Micro-Saw System

S No	Product Specification
*	The Console should be high quality and standard with integrated 8 roller pump for controlled irrigation.
*	Cleaning Spray and attachments for the Motor & Hand-piece should be provided as standard package.
*	Instruments should be made of high quality surgical steel and with alloy inserts as necessary.
*	There should be minimum or no vibrations in the motor & hand-piece during operation.
*	The instruments should be with European CE (EN Certified) or USFDA certification
*	Basic control unit with forward and reverse speed able to take $\geq 80,000$ rpm hand-pieces.
*	Motor unit should be light in weight, Autoclavable, speed from 100rpm to 40,000 rpm. should fit all the hand pieces listed below
*	Connecting cable should be Autoclavable and 2-3 meter in length
*	Sturdy foot switch with full function and control of irrigation, speed, hand-piece selection, program, etc.
*	Hand piece to hold Micro Sagittal Saw Blades , Number of revolutions $\geq 15,000$ rpm.
*	Saw Blade , short shaft, blade thickness 0.4mm, width of blade 12mm, working length 29mm for use with above hand piece 6 numbers
*	Saw Blade , short shaft, blade thickness 0.4mm, width of blade 6mm, working length 12mm for use with above hand piece 6 numbers
*	Saw Blade , short shaft, blade thickness 0.4mm, width of blade 10mm, working length 17mm for use with above hand piece 6 numbers
*	Saw Blade , short shaft, blade thickness 0.4mm, width of blade 06mm, working length 17mm for use with above hand piece 6 numbers
*	Saw Blade , short shaft, blade thickness 0.4mm, width of blade 4mm, working length 12mm, Package of 1, for use with above hand piece 6 Number
*	Saw Blade , long shaft, blade thickness 0.4mm width of blade 6mm & rounded, working length 12mm, Package of 1, for use with above hand piece 6 Number
*	Hand piece to hold Micro Compass Saw Blades , with 2mm stroke and cooling mechanism.
*	Saw Blade , blade thickness 0.4mm , 11mm, for use with above hand piece 12 Number
*	Saw Blade , blade thickness 0.4mm, 14mm, for use with above hand piece 12 Number
*	Saw Blade , blade thickness 0.4mm, 18mm for use with above hand piece 12 Number
*	Saw Blade , blade thickness 0.4mm, 22mm, for use with above hand piece 12 Number
*	Saw Blade , blade thickness 0.4mm, 26mm, for use with above hand piece 12 Number
*	Hand Piece , Angled, for use with straight shaft burrs of 70mm, transmission 1:1 (40,000 rev./min.) one in number with assorted set of 12 Burs
*	Hand Piece , Straight, for use with straight shaft burrs of 44.5mm, transmission 1:1 (40,000 rev./min.) one in number with assorted set 12 of Burs

*	All the rates of accessories & consumables should be quoted to approve for a period of three years.
*	Warranty for 3 years

12. BASIC FESS SET

1. Sickle knife, pointed, 19cm long
2. Freer elevator should be double ended, semi sharp and blunt, 20cm long
3. Small size oblong shaped Antrum curette, straight, 19cm
4. Cottle elevator double ended, semi sharp and blunt, graduated, length 20cm
5. Suction tube, with mandrel and cut-off hole, with distance marking 5-9cm, 9Fr., working length 10cm
6. V. Eicken antrum cannula, luer-lock, long curved, malleable, outer diameter 3mm & 2.5mm, length 12.5cm (One Each)
7. Stammberger Bioplar Suction forceps, 15 deg upturned, with suction channel, working length 12.5cm, to be supplied with Bipolar High frequency cord
8. Stamberger Antrum punch for Left & Right side downward and forward cutting, working length 10cm (One Each)
9. Stammberger Rhinoforce Antrum Punch, right and left side backward cutting, working length 10cm (One each)
10. Heuwiszer Antrum grasping forceps for maxillary sinus, jaws curved to right, fixed jaw curved 90 deg, opening 120 deg, movable jaw backward, length 10cm
11. Blakesley Rhinoforce nasal forceps, straight with working length 13cm
12. Blakesley-wilde Rhinoforce nasal forceps, Upturned 45deg & 90deg with working length 13cm (One Each)
13. Rhinoforce nasal scissors, Straight, working length 13cm
14. Giraffe forceps 65deg upturn, cup jaws diameter 3mm with horizontal & vertical opening, length 12cm (One Each)
15. Stammberger Punch, circular cutting circular punch, dia 4.5mm, working length 18cm
16. Stammberger Punch, 65 deg upturned, circular cutting, dia 3.5mm, length 17cm

Specifications of Septoplasty set instruments	
Killian nasal speculum	35/50/60/75/90mm 15cm/6"
Yankauer forceps	90mm. Serr. 18cm/7"
Tilley nasal gouge	5mm. V-shaped 17cm/5"
Killian nasal gouge	5mm. 17cm/6.75"
Mallet	OD-15/20/22/25mm 50gms/100gms/120gms/140gms with renewable Delrin head
Mallet	OD 15/20/22/25/30/40mm 50gms/100gms/120gms/140gms/400gms/700gms
Dissecting forceps/Sup./Serr	15cm/6" 25cm/10"

	3mm tips
Dissecting forceps/Nrw/Sup/Serr	15cm/6" 25cm/10"
Dissecting forceps McIndoe.	Serr. 15cm/6"

13 . Impedance Machine

General specifications

Power

Clinical and diagnostic middle ear analyzer

Dimension and weight:

- 370*290*180 mm
- Net weight : 3.5 kg

Test type: Tympanometry, acoustic reflex , reflex decay , quick test options , acoustic reflex latency test (ARLT) , ETF Intact and ETF perforated , SGrowth-DLI and non-acoustic

Display: Color display 7" TFT

User interface: Multilingual

Printer: Built-in fast thermal printer

Reports : Printed on thermal printer , pdf report create directly from the device and stored on USB pen drive with possible to add patient data and test comments via the USB keyboard (optional) , Data transfer to PC using management data suit

Data transfer to PC: Via cable through USB port

Communication port:

Nr. 1 USB host type a

Nr 1 USB slave type B

Power supply: 110- 240 V , AC 50/60 HZ

ENVIRONMENTLA TEMPERTRATURE

Storage: -20°C upto +50 °C

Operating +15°C up to +35°C

Humidity: up to 90 % (non-condensing)

Quality system; ISO 13485 , ISO 9001 certified quality system medical CE mark

Standard accessories

Headband probe HF

TDH39 for contra

Insert for contra

Kit of assorted ear tips, size from 4 mm up to 13 mm

Calibration cavity

Built-in fast thermal printer ‘

Thermal paper roll

Device dust roll

Device multilingual quick user handbook

Pen drive

Power supply cable (110 -220 v)

Spare fuse

Compliance regulatory standards

MDD 93/42/EEC and update 2007 / 47/ CEE: class IIa

Safety:IEC60601-1 , 3rd and 2nd edition, class 1 type B

EMC :IEC 60601-1-2

Impedance: IEC 60645-5/ANSI S.3.39 Type 1 and type 2

Tympanometry operating specifications

Probe tone : 226 , 678 , 800 , 1000 hz for traditional y curve tympanometry with added B and G curve for traditional Y curve tympanometry

Intensity : 226 hz : 85Db SPL ± 2 Db , 678, 800 and 1000 hz : 75 db SPL ± 2 Db

Frequency accuracy : $\pm 0, 5$ %

Harmonic distortion : less then 1 %

Admittance measurement

226 hz : 0 to +5 ml

Sensitivity scale : auto scales to appropriate range ,available scales 1.5 , 2 and 5 ml

678 , 800 and 1000 hz : 0 to +25 mmho

Sensitivity scale : auto scale to appropriate range , available scales 5 , 10 , 15 , 20 , 25 mmho

Air pressure

Control : automatic and manual

Range : from + 400 up to -600 dapa from +200 up to 400 dapa both adjustable in 50 dapa steps

Pressure accuracy : +/- 10 dapa or +/- 10%

Sweep rate : 50 , 100,200,300dapa / sec and automatic

Indicator: measured value is displayed on the graphical display

Safety limitation: -800 up to +600 dapa

Compliance range: from 0,1 up to 5 ml

Eustachian tube function

ETF test for use with both intact and perforated eardrum

Acoustic reflex test

Reflex test method: threshold, automatic , manual

Stimulated duration :0,5 , 1 or 2 sec

User selectable protocol for all test methods

Ipsi or contralateral stimulation for all reflex test

Automatic peak search function available for all test methods

Manual reflex; pump manual control of all stimulus

Reflex decay: threshold automatic manual

Stimulus duration: 10 or 20 sec

ARLT: threshold, automatic manual

Duration: 1 sec fixed

Frequencies and intensity ranges

Ipsilateral

Pure tone level range from 50 to 110

Noise level range from 50 100

Frequency 500 1000 2000 3000 4000 hz ,BBN,HP or LP noise

Accuracy: $\pm 1\%$

Harmonic distortion (THD): less than 3 %

Contralateral

Pure tone level range from 50 to 120

Noise level range from 50 to 115

Frequency : 250 , 500, 1000, 2000 , 3000 , 4000 , 6000 , 8000 hz BBN , HP or LP noise

Accuracy: ± 1 %

Calibration accuracy ± 3 db

Level steps 1 , 2 5 or 10 db

On / off ratio; 70 db minimum

