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# Technical Specifications

## AD629

# Diagnostic Audiometer

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## License Overview

International configuration AD629		
	Basic license	Extended license
<b>Licenses Audiometry</b>		
Basic Audiometry	x	x
Békésy	x	x
SISI	x	x
Langenbeck	x	x
Stenger	x	x
Modified Hughson-Westlake	x	x
ABLB	x	x
Speech testing with CD/Mic	x	x
Build-in wave files	x	x
Binaural Speech		x
Hearing Loss Simulator (HLS)		x
MHA		x
QuickSIN	optional	optional
TEN test	optional	optional
High Frequency (HF)	optional	optional
Freefield Lineout	x	x
Hybrid mode - PC controlled mode	optional	optional
Sync mode - Audiogram transfer	optional	optional
<b>Functions available only in Diagnostics suite</b>		
Weber	x	x
MaskingHelper	x	x

## Languages supported in IMP and AUD

	Chinese	Czech	English	Finnish	French	German	Greek	Italian	Japanese	Korean	Norwegian	Polish	Portuguese	Russian	Spanish	Turkish
<b>IMP</b>																
MT10			X		X	X										
Existing AT235			X			X										
New AT235	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Existing AA222			X			X										
New AA222	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Titan	X	X	X		X	X		X	X	X			X	X	X	
<b>AUD</b>																
AS608			X		X	X									X	
AD226	X		X		X	X		X				X	X	X	X	X
AD629 / AD229	X *	X *	X	X *	X	X	X *	X	X *	X *	X *	X	X *	X *	X	X
AC40	X *	X *	X	X *	X	X	X *	X	X *	X *	X *	X	X *	X *	X	X
<b>Suites</b>																
Titan suite	X	X	X		X	X		X	X			X	X	X	X	X
DS	X	X	X		X	X	X	X	X	X		X	X	X	X	X

## Included and Optional Parts

<b>Included parts</b>	DD45 Audiometric headset B71 Bone conductor APS3 Patient response button Goose neck microphone Power cable Operation manual CD Multilingual instructions for use
Optional parts	Diagnostic Suite software OtoAccess database 21925 Amplivox audiocups, noise reducing headset Carrying case (Standard or Trolley Style) EARTone3A/5A Audiometric insert phones IP30 Audiometric insert phones HDA300 Audiometric headset with double mono 6.3mm jack TDH39 Audiometric headset CIR33 Insert earphone set for masking or monitoring Talk back microphone Sound field speakers SP90 (with external power amp) AP12 Power Amplifier 2x12 Watt AP70 Power Amplifier 2x70 Watt

# General Technical Specifications

## AD629 Technical Specification

<b>Safety Standards</b>	IEC 60601-1, ES60601-1, CAN/CSA-C22.2 No.60601-1 Class I, Applied parts type B, Continuous operation	
<b>EMC Standard</b>	IEC 60601-1-2:2001 + A1:2004	
<b>Audiometer Standards</b>	Tone Audiometer: IEC 60645 -1, ANSI S3.6 -2010, Type 2, HF IEC 60645-4. Speech Audiometer: IEC 60645-2/ANSI S3.6 type B or B-E. Auto threshold tests: ISO 8253-1	
<b>Calibration</b>	Calibration information and instructions is located in the AD629 Service manual	
<b>Air Conduction</b>	DD45: TDH39: HDA300: HDA280 E.A.R Tone 3A/5A: IP 30:	PTB/DTU report 2009 ISO 389-1 1998, ANSI S3.6-2010 PTB report PTB 1.61 – 4064893/13 PTB report 2004 ISO 389-2 1994, ANSI S3.6-2010 ISO 389-2 1994, ANSI S3.6-2010 DES-2361 CIR 33 ISO 389-2
<b>Bone Conduction</b>	B71: Placement:	ISO 389-3 1994, ANSI S3.6-2010 Mastoid
<b>Free Field</b>	ISO 389-7 2005, ANSI S3.6-2010	
<b>High Frequency</b>	ISO 389-5 2004, ANSI S3.6-2010	
<b>Effective masking</b>	ISO 389-4 1994, ANSI S3.6-2010	
<b>Transducers</b>	DD45 TDH39 HDA300 HDA280 B71 Bone E.A.R Tone 3A/5A: IP30 CIR 33	Headband Static Force 4.5N ±0.5N Headband Static Force 4.5N ±0.5N Headband Static Force 4.5N ±0.5N Headband Static Force 5N ±0.5N Headband Static Force 5.4N ±0.5N
<b>Patient Response switch</b>	One hand held push button.	
<b>Patient communication</b>	Talk Forward (TF) and Talk Back (TB).	
<b>Monitor</b>	Output through built-in speaker or through external earphone or speaker.	
<b>Special tests/test battery</b>	SISI. ABLB. Stenger. Stenger Speech. Langenbeck (tone in noise). Békésy Test. 2 channel speech, 2 channels Master Hearing Aid, Auto threshold. Auto threshold tests: Available time for patient to respond: Same as tone presentation Increment of hearing level: 5dB.  Auto threshold test (Békésy): Mode of operation: Békésy Rate of level change: 2.5 dB/s ±20% Smallest increment of level: 0.5 dB	
<b>Stimuli</b>		
<b>Tone</b>	125-20000Hz separated in two ranges 125-8000Hz and 8000-20000Hz. Resolution 1/2-1/24 octave.	
<b>Warble Tone</b>	1-10 Hz sine +/- 5% modulation	

<b>Wave file</b>	44100Hz sampling, 16 bits, 2 channels																																																																															
<b>Masking</b>	Automatic selection of narrow band noise (or white noise) for tone presentation and speech noise for speech presentation.  Narrow band noise: IEC 60645-1:2001, 5/12 Octave filter with the same centre frequency resolution as pure Tone.  White noise: 80-20000Hz measured with constant bandwidth  Speech Noise. IEC 60645-2:1993 125-6000Hz falling 12dB/octave above 1KHz +/-5dB																																																																															
<b>Presentation</b>	Manual or Reverse. Single or multiple pulses.																																																																															
<b>Intensity</b>	Check the accompanying Appendix  Available Intensity Steps is 1, 2 or 5dB  Extended range function: If not activated, the Air Conduction output will be limited to 20 dB below maximum output.																																																																															
<b>Frequency range</b>	125Hz to 8kHz (Optional High Frequency: 8 kHz to 20 kHz) 125Hz, 250Hz, 750Hz, 1500Hz and 8kHz may freely be deselected																																																																															
<b>Speech</b>	<p><u>Frequency Response:</u></p> <table border="1"> <thead> <tr> <th rowspan="2">(Typical)</th> <th rowspan="2">Frequency (Hz)</th> <th colspan="2">Linear (dB)</th> <th colspan="2">FFeq<sub>uv</sub> (dB)</th> </tr> <tr> <th>Ext sign<sup>1</sup></th> <th>Int. Sign<sup>2</sup></th> <th>Ext sign<sup>1</sup></th> <th>Int. Sign<sup>2</sup></th> </tr> </thead> <tbody> <tr> <td rowspan="3">TDH39 (IEC 60318-3 Coupler)</td> <td>125-250</td> <td>+0/-2</td> <td>+0/-2</td> <td>+0/-8</td> <td>+0/-8</td> </tr> <tr> <td>250-4000</td> <td>+2/-2</td> <td>+2/-1</td> <td>+2/-2</td> <td>+2/-2</td> </tr> <tr> <td>4000-6300</td> <td>+1/-0</td> <td>+1/-0</td> <td>+1/-0</td> <td>+1/-0</td> </tr> <tr> <td rowspan="3">DD45 (IEC 60318-3 Coupler)</td> <td>125-250</td> <td>+0/-2</td> <td>+1/-0</td> <td>+0/-</td> <td>+0/-7</td> </tr> <tr> <td>250-4000</td> <td>+1/-1</td> <td>+1/-1</td> <td>+2/-2</td> <td>+2/-3</td> </tr> <tr> <td>4000-6300</td> <td>+0/-2</td> <td>+0/-2</td> <td>+1/-1</td> <td>+1/-1</td> </tr> <tr> <td>E.A.R Tone 3A (IEC 60318-5 Coupler)</td> <td>250-4000</td> <td>+2/-3</td> <td>+4/-1</td> <td>(Non linear)</td> <td></td> </tr> <tr> <td>IP 30 (IEC 60318-5 Coupler)</td> <td>250-4000</td> <td>+2/-3</td> <td>+4/-1</td> <td colspan="2">(Non linear)</td> </tr> <tr> <td>B71 Bone Conductor (IEC 60318-6 Coupler)</td> <td>250-4000</td> <td>+12/-12</td> <td>+12/-12</td> <td colspan="2">(Non linear)</td> </tr> <tr> <td></td> <td colspan="4">2% THD at 1000 Hz max output +9 dB (increasing at lower frequency) Level range: -10 to 50 dB HL</td> <td colspan="2"></td> </tr> <tr> <td></td> <td colspan="3">1. Ext. sign: CD input</td> <td colspan="3">2. Int. sign: Wave files</td> </tr> </tbody> </table>						(Typical)	Frequency (Hz)	Linear (dB)		FFeq <sub>uv</sub> (dB)		Ext sign <sup>1</sup>	Int. Sign <sup>2</sup>	Ext sign <sup>1</sup>	Int. Sign <sup>2</sup>	TDH39 (IEC 60318-3 Coupler)	125-250	+0/-2	+0/-2	+0/-8	+0/-8	250-4000	+2/-2	+2/-1	+2/-2	+2/-2	4000-6300	+1/-0	+1/-0	+1/-0	+1/-0	DD45 (IEC 60318-3 Coupler)	125-250	+0/-2	+1/-0	+0/-	+0/-7	250-4000	+1/-1	+1/-1	+2/-2	+2/-3	4000-6300	+0/-2	+0/-2	+1/-1	+1/-1	E.A.R Tone 3A (IEC 60318-5 Coupler)	250-4000	+2/-3	+4/-1	(Non linear)		IP 30 (IEC 60318-5 Coupler)	250-4000	+2/-3	+4/-1	(Non linear)		B71 Bone Conductor (IEC 60318-6 Coupler)	250-4000	+12/-12	+12/-12	(Non linear)			2% THD at 1000 Hz max output +9 dB (increasing at lower frequency) Level range: -10 to 50 dB HL							1. Ext. sign: CD input			2. Int. sign: Wave files		
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<b>External signal</b>	Speech replaying equipment connected to the CD input must have a signal-to-noise ratio of 45 dB or higher.  The speech material used must include a calibration signal suitable for adjusting the input to 0 dBVU.																																																																															
<b>Free Field</b>	<p><u>Power amplifier and loudspeakers</u></p> <p>With an input of 7 V<sub>rms</sub> - Amplifier and loudspeakers must be able to create a Sound Pressure Level of 100 dB in a distance of 1 meter - and meet the following requirements:</p> <table> <tr> <td>Frequency Response</td> <td>Total Harmonic Distortion</td> </tr> <tr> <td>125-250 Hz    +0/-10 dB</td> <td>80 dB SPL    &lt; 3%</td> </tr> <tr> <td>250-4000 Hz   ±3 dB</td> <td>100 dB SPL   &lt; 10%</td> </tr> <tr> <td>4000-6300 Hz   ±5 dB</td> <td></td> </tr> </table>						Frequency Response	Total Harmonic Distortion	125-250 Hz    +0/-10 dB	80 dB SPL    < 3%	250-4000 Hz   ±3 dB	100 dB SPL   < 10%	4000-6300 Hz   ±5 dB																																																																			
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<b>Internal storage</b>	250 patients and unlimited sessions/measurements/audiograms																																																																															

<b>Signal Indicator(VU)</b>	Time weighting: 300mS Dynamic range: 23dB Rectifier characteristics: RMS  Selectable inputs are provide with an attenuator by which the level can be adjusted to the indicator reference position(0dB)	
<b>Data Connections (sockets)</b>	4 x USB A (compatible with USB 1.1 and later) 1 x USB B (compatible with USB 1.1 and later) 1 x LAN Ethernet	
<b>External devices (USB)</b>	Standard PC mouse and keyboard (for data entry) Supported printers: Standard PCL3 printers (HP, Epson, Canon)	
<b>Input Specifications</b>	TB	100uVrms at max. gain for 0dB reading Input impedance : 3.2KOhm
	Mic.2	100uVrms at max. gain for 0dB reading Input impedance : 3.2KOhm
	CD	7mVrms at max. gain for 0dB reading Input impedance : 47KOhm
	TF (side panel)	100uVrms at max. gain for 0dB reading Input impedance : 3.2KOhm
	TF (front panel)	100uVrms at max. gain for 0dB reading Input impedance : 3.2KOhm
	Wave files	Plays wave file from hard disk drive
<b>Output Specifications</b>	FF1 & 2	7Vrms at min. 2KOhm load 60-20000Hz -3dB
	Left & Right	7Vrms at 10 Ohms load 60-20000Hz -3dB
	Ins. Left & Right	7Vrms at 10 Ohms load 60-20000Hz -3dB
	Bone	7Vrms at 10 Ohms load 60-10000Hz -3dB
	Ins. Mask	7Vrms at 10 Ohms load 60-20000Hz -3dB
	Monitor(side panel)	2x 3Vrms at 32 Ohms / 1.5Vrms at 8 Ohms load 60-20000Hz -3dB
<b>Display</b>	5,7 inch high resolution color display 640x480 pixels	
<b>Compatible software</b>	Diagnostic Suite - Noah, OtoAccess and XML compatible	
<b>Dimensions (LxWxH)</b>	36.5 x 29.5 x 6.5 cm / 14.4 x 11.6 x 2.6 inches	
<b>Weight</b>	3.3kg/6.3lb	
<b>Power supply</b>	100-240 V~, 50-60Hz max 0.5A	
<b>Operation environment</b>	Temperature:	15-35°C
	Re. Humidity:	30-90% Non condensing
<b>Transport and storage</b>	Transport temperature:	-20-50°C
	Storage temperature:	0-50°C
	Re. Humidity:	10-95% Non condensing