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Technical Specifications

# AD528



D-0121388-A – 2018/11



**Interacoustics**



## Included and optional parts

### Included parts

AD528 instrument	
Power supply	UES24LCP-120200SPA
Audiometric headset	DD45 <sup>1</sup> /IP30 <sup>1</sup>
Bone conductor	B71 <sup>1</sup>
Patient response	APS3 <sup>1</sup>
Instructions for use	Multilingual

### Optional parts


Audiometric headset	DD450 <sup>1</sup> /IP30 <sup>1</sup> /DD45 <sup>1</sup>
Insert masking transducer	IP30 single <sup>1</sup>
Monitor headset	MTH400m
Talk back	EM400 Electret Microphone/EMS400 Electret Microphone
Free field speakers	SP90 w. amplifier/SP90A
Printer	HM-E300 printer/A4 printer (HP PLC 3/HP PLC3GUI)
Diagnostic Suite software/ ADI	Sync
OtoAccess™ database	Patient database

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<sup>1</sup> Applied part according to IEC60601-1



## General technical specifications

<b>General</b>		
Medical CE-mark:	The CE-mark indicates that Interacoustics A/S meets the requirements of Annex II of the Medical Device Directive 93/42/EEC. Approval of the quality system is made by TÜV – identification no0123	
Standards:	Safety:	IEC 60601-1 2005/EN 60601-1 2006 and A1 2012 ANSI/AAMI ES60601-1:2005/(R)2012 CAN/CSA-C22.2 No. 60601-1:14 Class II, Type B applied parts
	EMC:	IEC 60601-1-2 (2014)
	Audiometer:	Tone Audiometer: IEC 60645 -1 (2017), ANSI S3.6 (2010), Type 2 Speech Audiometer: IEC 60645-1 (2017)/ANSI S3.6 (2010) type B or B-E. Auto threshold tests: ISO 8253-1 (2010)
Operation environment:	Temperature:	15-35 °C
	Relative humidity:	30-90%
	Ambient pressure:	98kPa – 104kPa
	Warm-up time:	1 minute
Transport & storage:	Storage temperature:	0°C-50°C
	Transport temperature:	-20-50 °C
	Rel. humidity:	10-95%
Internal battery	CR2032 3V, 230mAh, Li	
PC control:	USB:	Input/output for computer communication. Diagnostic Suite, OtoAccess™, NOAH, Audiometric data interface (ADI).
Printer (optional):	Thermal Direct print	HM-E300 Printer language: HP PCL 3/HP PCL3 GUI
Power supply 	UES24LCP-120200SPA	Use only specified power supply unit type Input: 100-240VAC 50/60 Hz, 500mA Output: 12.0 VDC 2.0A
Dimensions	H x W x L	11 x 28 x 36 cm 4.3 x 11 x 14 inches
AD528 weight	1.5 kg / 3.3 lb	
Display	5 inch high resolution color display 480x272	



Audiometry measure system						
Air Conduction	DD45: DD450: IP 30:	ANSI S3.6 2018 / ISO 389-1 2017 ANSI S3.6 - 2018 ISO 389-2 1994, ANSI S3.6-2018	Headband Static Force 4.5N ±0.5N Headband Static Force 10N ±0.5N			
Bone Conduction	B71:	ISO 389-3 1994, ANSI S3.6-2010 Placement: Mastoid	Headband Static Force 5.4N ±0.5N			
Free Field	ISO 389-7 2005, ANSI S3.6-2010					
Effective masking	ISO 389-4 1994, ANSI S3.6-2010					
Patient response	One handheld push button					
Patient communication	Talk forward (TF) and Talk back (TB)					
Monitor	Output through built-in speaker, monitor headset or speaker					
Special tests/test battery	SISI, ABLB, Stenger, Tone in noise (Langenbeck), Speech Ch2, Auto threshold tests: Available time for patient to respond 1 or 2 s: Same as tone presentation, increment 5 dB.					
Warble	1-10 Hz sine +/- 5% modulation					
Wave file	44100 Hz sampling, 16 bits, 2 channels					
Masking	Automatic selection of narrow band noise (or white noise) for tone presentation and speech noise for speech presentation. Narrow band noise: IEC 60645-1:2017, 5/12 Octave filter with the same center frequency resolution as pure Tone. White noise: 80-8000 Hz measured with constant bandwidth Speech Noise: IEC 60645-1:2017 125-6000 Hz falling 12 dB/octave above 1 KHz +/- 5 dB					
Presentation	Manual or reverse. Single or multiple pulses. Auto testing: duration 1-2 s adjusted in 0.1 s intervals					
Intensity	Check the accompanying Appendix. Available Intensity Steps is 1, 2 or 5 dB Extended range function: If not activated, the Air Conduction output will be limited to 20 dB below maximum output.					
Frequency range	125 Hz to 8 kHz					
Speech	Frequency response	Frequency (Hz)	Linear (dB)		FFeqv. (dB)	
			Ext sign	Int. Sign	Ext sign	Int. Sign
DD45 (IEC 60318-3 Coupler)	250-4000	250-4000	+0/-2	+1/-0	+0/-	+0/-7
			+1/-1	+1/-1	+2/-2	+2/-3
DD450 (IEC 60318-1 Coupler)	250-4000	250-4000	+0/-2	+1/-0	+0/-	+0/-7
			+1/-1	+1/-1	+2/-2	+2/-3
IP 30 (IEC 60318-5 Coupler)	250-4000	250-4000	+0/-2	+0/-2	+1/-1	+1/-1
			+2/-3	+4/-1	(Non-linear)	
B71 Conductor (IEC 60318-6 Coupler)	250-4000	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, overall THD <6% 1. Ext. sign: CD input    2. Int. sign: Wave files						
External signal	Speech replaying equipment connected to the aux 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 dB VU.					
Microphone (Live speech)	The microphone of the MTH400m is used for live speech. Microphone gain must be adjusted to 0 VU prior to use.					



Free field	<p><b>Power amplifier and loudspeakers</b> With an input of 7 Vrms - 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	
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									
Internal storage	50.000 sessions (500 clients, 100 sessions/client)								
Signal Indicator (VU)	<p>Time weighting:            300 mS Dynamic range:            23 dB Rectifier characteristics:    RMS</p> <p>Selectable inputs are provide with an attenuator by which the level can be adjusted to the indicator reference position (0 dB).</p>								