

Frequency range	
Insert earphones:	Standard frequencies: 125 - 8000 Hz
TDH39 earphones:	Standard frequencies: 125 - 8000 Hz
BC:	Standard frequencies: 250 - 4000 Hz
SF:	Standard frequencies: 125 - 8000 Hz
Accuracy:	< 0.03%
FRESH noise stimulus:	Available in entire frequency range within the transducer specified range (for SF 125 - 8000 Hz). Accuracy 0.3%
Narrow Band Noise masking:	Available for each stimulus frequency.
Frequency resolution:	125 to 8000 Hz at standard frequencies
Stimulus types	
Tone audiometry	Tone, Warble, Pulsed tone, Pulsed warble, FRESH Noise
Loudness Scaling	Warble, ISTS, FRESH Noise
Masking types	
AC, BC, SF:	Narrow Band Noise (correlated) Speech Weighted Noise (correlated) White Noise (Wide band noise) (correlated)
Stimulus modulation	
FM (Warble):	Adjustable modulation rate and depth Modulation rate: 1-20 Hz (default: 5 Hz). Modulation depth: 1-25% of center frequency (default: 5%).
SISI:	5, 2, 1 dB increments
Signal presentation	
Accuracy of sound level	
Entire level range (AC):	125 to 5000 Hz: ± 3 dB, 5000 to 8000 Hz: ± 5 dB
Entire level range (BC):	250 to 4000 Hz: ± 4 dB
Attenuator	
1 or 5 dB step resolution over the entire range.	
HL Range	
The maximum output levels from MADSEN A450 depend on the actual sensitivity of the individual transducers, and they will be slightly different for each unit. However, the minimum requirements from IEC and ANSI standards are fulfilled for all units.	
Total harmonic distortion	
Air < 2.5%	
Bone < 5%	
Selectable transducers	
AC:	TDH 39 headphones, and Insert Earphones
BC:	Bone oscillator (Mastoid)
SF:	Passive sound field speaker using the built-in amplifier, or External amplifier using the line output.
Transducer options depend on how MADSEN A450 is ordered and calibrated.	
Outputs	
AC:	2 x 2 mono jacks, 6.3 mm (1/4 inch)
BC:	1 x mono jack, 6.3 mm (1/4 inch)
Speaker for SF power output and Counseling and Simulations:	3 x terminals, 3 x 40 W peak, 8 Ω load
SF line output:	2 x 1.6 Vrms,
External inputs	
CD/Analog line in:	0.2 to 2.0 Vrms, 10 k Ω , 1 stereo 3.5 mm (1/8 inch) jack
Talk Back microphone:	Electret microphone Input voltage: 0.002 to 0.02 Vrms Input resistance: 2.21 k Ω . 3.5 mm (1/8 inch) jack
24V DC power supply:	DC power, 2.5 mm
Stimulus presentation	
Normal, Continuous on, Pulsed	
Operator accessories	
Operator monitor headphones:	40 mW 16 Ω 3.5 mm (1/8 inch) stereo jack
Operator microphone:	Electret microphone Input voltage: 0.002 to 0.02 Vrms, Input resistance: 2.21 k Ω . 3.5 mm (1/8 inch) jack
USB port connector	
Type:	USB 2.0 device port
Speed:	High speed
Transport and storage	
Temperature:	-20°C to +60°C (-22°F to 140°F)
Air humidity:	10% to 90%, non-condensing
Air pressure:	500 hPa to 1060 hPa
Operating environment	
Mode of operation:	Continuous
Temperature:	+15°C to +35°C (59°F to 95°F)
Air humidity:	30% to 90%, non-condensing
Air pressure:	700 hPa to 1060 hPa.
(Operation in temperatures exceeding -20°C (-4°F) or +60°C (140°F) may cause permanent damage.)	
Warm-up time	
< 5 min.	

Disposal	
MADSEN A450 can be disposed of as normal electronic waste, according to WEEE and local regulations.	
Dimensions	
MADSEN A450:	Approx. 279 x 196 x 54 mm, (10.0 x 7.7 x 2.1 inches)
Weight	
MADSEN A450:	Approx. 0.7 kg, (1.5 lb)
AURICAL Aud Power supply	
Power supply	
Power supply	
MeanWell MES50A-6P1J, 50W	Output: 24 V, 2.08 A; Input: 100-240 V AC, 50/60 Hz, 1.5 - 0.8 A
Power consumption	< 60 VA
Standards	
Audiometer:	IEC 60645-1, Type 2, 2010; IEC 60645-2, Type A, 1993;ANSI S3.6
Audiometer:	IEC 60645-1, Type 3, 2010; IEC 60645-2, Type B, 1993;ANSI S3.6
Patient Safety:	IEC 60601-1, Class 1, Type B; UL 60601-1; CAN/CSA-C22.2 NO 601.1-90.
EMC:	IEC 60601-1-2:2007 and EN 60601-1-2:2007 IEC 60601-1-2:2014 and EN 60601-1-2:2015
Accessories	
Standard accessories and optional accessories may vary from country to country - please consult your local distributor. TDH 39 headphones (Headband: HB-7, HB-8), Bone oscillators: BC-1, B-71, Otometrics insert phones, Sound field loudspeakers, Monitor headphones with boom microphone, Talkback microphone, Patient Responder, Power supply and mains cable, Reference Manual, User Guide, Quick Guide	
System requirements	
For system requirements, please refer to the OTOsuite data sheet.	

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