MADSEN Astera²

Technical specifications

Type identification	
MADSEN Astera² is type 1066 from Natus Medical Denmark ApS.	
Channels	
Two separate and identical channels	
Frequency range	
TDH39 earphones:	Standard frequencies: 125 - 12500 Hz
HDA 300 earphones:	Standard frequencies: 125 - 20000 Hz
Insert earphones:	Standard frequencies: 125 - 8000 Hz
BC:	Standard frequencies: 250 - 8000 Hz
SF:	Standard frequencies: 125 - 20000 Hz
FRESH noise stimulus:	Available in entire frequency range within the transducer specified range.(for SF 125 - 12500 Hz). Accuracy 0.3%
Narrow Band Noise masking:	Available in entire frequency range
Frequency resolution:	1/48, 1/24, 1/12, and 1/6 oct, 1 Hz step
Stimulus types	
Tone Warble Pulsed tone Pulsed warble	
FRESH noise	Frequency-specific hearing assessment noise. Consists of noise bands, with frequency-specific filter width. The FRESH noise is filtered to obtain very steep slopes outside the passband.
Pulsed FRESH noise	
Masking types	
AC and BC:	Narrow Band Noise (Correlated) Speech Weighted Noise (Correlated) White Noise (Wide band noise) (Correlated)
SF:	Narrow Band Noise (Non-correlated) Speech Weighted Noise (Non-correlated) White Noise (Wide band noise) (Non-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
Accuracy of sound level	
Entire level range (AC):	125 to 5000 Hz: ±3 dB 5000 to 20000 Hz: ±5 dB
Entire level range (BC):	250 to 5000 Hz: ±4 dB 5000 to 8000 Hz: ±5 dB
Level resolution	
1, 2, or 5 dB step resolution over the entire range	
HL Range	
Maximum output will be limited by the transducer.	
AC:	-10 to 120 dB HL (500 to 4000 Hz; supra-aural earphones)
BC:	-10 to 80 dB HL (1500 to 3000 Hz; mastoid placement)
SF:	103 dB HL (Note: with external amplifier)
Total harmonic distortion	
Air < 2.5 %	
Bone < 5 %	
Selectable transducers	
AC:	TDH39, HDA 300, and Insert Earphones
BC:	Bone vibrator (Mastoid / Forehead)
SF:	Passive sound field speaker, using the built-in amplifier inMADSEN Astera², or Sound field speaker with built-in amplifier or external amplifier, with both types using the line output from MADSEN Astera².
Outputs	
AC:	3 x 2 mono jacks, 1/4 "
BC:	2 x mono jacks, 1/4 "
SF power output:	5 x terminals, 5 x 40 W peak, 8Ω load
SF line output:	3 x mini XLR 6 pin 5 x +6 dBu, balanced
External inputs	
CD/Analog line in:	0.2 to 2.0 Vrms, 10 kΩ 2 x RCA phone
Talk Back microphone:	Electret microphone Input voltage: 0.002 to 0.02 Vrms Input resistance: 2.21 kΩ. 3.5 mm jack
Stimulus presentation	
Normal:	The signal is presented when the **Stimulate** button is pressed.
Continuous ON:	The signal is interrupted when the **Stimulate** button is pressed.
Pulse:	The signal is pulsed.
Pulse duration:	225 ms on and 225 ms off (default).

Operator accessories	
Operator monitor speaker	1.5W 8Ω , connected between tip and ring, sleeve floating 3.5 mm jack
Operator monitor headset - headphones	40 mW 16Ω 3.5 mm jack
Operator monitor headset - boom microphone	Electret microphone Input voltage: 0.002 to 0.02 Vrms, Input resistance: 2.21 kΩ. 3.5 mm jack
Operator desktop microphone	Electret microphone Input voltage: 0.002 to 0.02 Vrms, Input resistance: 2.21 kΩ. 3.5 mm jack
Assistant monitor headset	40 mW 16Ω 3.5 mm jack
USB port connector	
Type:	USB device port
Interface:	USB 2.0
Speed:	Full-speed (12 Mb/s)
Disposal	
MADSEN Astera² can be disposed of as normal electronic waste, according to WEEE and local regulations.	
Dimensions	
Approx. 325 x 255 x 60 mm (12.8 x 10 x 2.4 inches)	
Weight	
Approx. 1.3 kg (2.85 lb)	
Power supply	
External power supply, types:	
Delta Electronics, Inc. MDS-090AAS24	Output: 24 V DC, 3.75 A Input: 100-240 V AC, 50-60 Hz, 1.5 A - 0.75 A
	Patient Safety when used with the specified power supply, Delta Electronics, Inc., type MDS-090AAS24: Complies with IEC 60601-1 (3rd), Class 1, Type B; AAMI ES60601-1; CSA C22.2 NO. 60601-1-08-CAN/CSA. EMC: IEC 60601-1-2
XP Power PCM80PS24	Output: 24 V DC, 3.33 A max Input: 100-240 V AC, 47-63 Hz, 1.1 A - 0.45 A
	Patient Safety when used with the specified power supply, XP Power, type PCM80PS24: Complies with IEC 60601-1 (2nd), Class 1, Type B; UL 60601-1; CAN/CSA-C22.2 NO 601.1-90.
Power consumption	
< 90 VA	
Standards	
Audiometer:	IEC60645-1, Type 1, IEC60645-2 and ANSI S3.6
Patient Safety:	Patient Safety when used with the specified power supply, Delta Electronics, Inc., type MDS-090AAS24: Complies with IEC 60601-1 (3rd), Class 1, Type B; AAMI ES60601-1; CSA C22.2 NO. 60601-1-08-CAN/CSA. EMC: IEC 60601-1-2 Patient Safety when used with the specified power supply, XP Power, type PCM80PS24: Complies with IEC 60601-1 (2nd), 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.

MADSEN Astera²: TDH 39 headphones (Headband: HB-7, HB-8), HDA 300 headphones, Otometrics insert phones, Bone oscillators: BC-1, B-71, Sound field loudspeakers, Monitor headphones with boom microphone, Assistant headphones, Desktop microphone, Talkback microphone, Monitor speaker, Patient Responder (one or two), Power supply and mains cable, Wall mounting plate, Connection cables, AURICAL FreeFit, MADSEN Astera² Reference Manual, MADSEN Astera² User Guide. **ACP**: USB cables , Wrist support.

System requirements

For system requirements, please refer to the OTOsuite data sheet.

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