

Type identification			
MADSEN Zodiac is type 1096 from GN Otometrics A/S			
Feature table			
	Quick Check	Diagnostic	Clinical
Tympanometry, auto	X	X	X
Tympanometry, manual		X	X
Tympanometry History	X	X	X
Probe tone, 226 Hz	X	X	X
Probe tone, 1000 Hz		X	X
Probe tone, 678 and 800 Hz			X
Reflex Screening	X	X	X
Reflex Threshold (Ipsi/Contra)		X	X
Reflex Decay		X	X
ETF-I (Intact)		X	X
ETF-P (Perforated)			X
B & G tympanograms			X
Admittance Recorder			X
Compliance measuring system			
Probe tone:	226 Hz at 85 dB SPL ± 3 dB 678 Hz at 72 dB SPL ± 3 dB 800 Hz at 70.5 dB SPL ± 3 dB 1000 Hz at 69 dB SPL ± 3 dB		
Dynamic probe tone level:	The probe tone level will be compensated to accommodate varying ear canal volumes. The output level will be decreased in volumes < 1.7 ml The output level will be increased in volumes > 2.3 ml		
THD:	< 1% in 2 cc		
Frequency accuracy:	± 0.5%		
Range:	0.2 ml to 5.0 ml ± 5% or 0.05 ml whichever is greater * 5.0 ml to 8.0 ml ± 15% * * The accuracy stated requires that calibration has been performed at the altitude where the device is to be put into operation		
Acoustic reflex			
Sensitivity			
Reflex Threshold and Reflex Decay:	0.01, 0.02, 0.03, 0.04 or 0.05 mmho		
Reflex Screening:	0.04 mmho		
Step size dB:	Diagnostic: 5, 10 dB Clinical: 1, 2, 5, 10 dB		
Contralateral Stimulation			
Pure tones:	500 Hz, 1000 Hz, 2000 Hz, 4000 Hz		
Frequency accuracy:	± 0.5%		
Range:	BBN, LPN, HPN at 50 to 110 dB SPL * ± 3 dB * measured in the respective couplers		
	<b>Contralateral insert phone:</b>	<b>Contralateral TDH-39 phone:</b>	
Range:	500 Hz at 50 to 115 dB HL ± 3 dB 1000 Hz at 50 to 120 dB HL ± 3 dB 2000 Hz at 50 to 120 dB HL ± 3 dB 4000 Hz at 50 to 120 dB HL ± 3 dB	500 Hz at 50 to 115 dB HL ± 3 dB 1000 Hz at 50 to 120 dB HL ± 3 dB 2000 Hz at 50 to 115 dB HL ± 3 dB 4000 Hz at 50 to 115 dB HL ± 3 dB	
THD:	< 5% for levels below 110 dB HL < 10% for levels above 110 dB HL	< 2.5 % for levels below 110 dB HL < 5 % for levels above 110 dB HL	
Ipsilateral Stimulation			
Tone:	500 Hz, 1000 Hz, 2000 Hz, 4000 Hz		
Frequency accuracy:	± 0.5%		
Range:	BBN, LPN, HPN at 50 to 110 dB SPL * ± 3 dB (* measured in calibration coupler)		
Screening range:	BBN at 50 to 90 dB SPL * ± 3 dB (* measured in calibration coupler)		
Step size dB:	1, 2, 5, 10 dB		
Decay range:	50 to 100 dB HL* (* artifacts may start to occur at levels above 95 dB HL in 0.5 cc)		
Lowpass noise			
Contralateral TDH-39 headphone			
Band limit:	1600 Hz (nominal -3 dB point)		
Slope:	The slope is between -12 and -18 dB/octave above 1600 Hz, with an additional ±6 dB tolerance. Above 8500 Hz, the spectrum level remains below -34 dB re. 1600 Hz level.		
Level:	Noise level is indicated in dB HL. Tolerance ±5 dB.		
Contralateral insert earphone and ipsilateral probe			
Bandwidth:	1600 Hz (nominal -3 dB point)		
Slope:	The slope is between -12 and -18 dB/octave above 1600 Hz, with an additional ±6 dB tolerance. Above 8500 Hz, the spectrum level remains below -34 dB re. 1600 Hz level.		
Level:	Noise level is indicated in dB HL. Tolerance ±5 dB.		
Highpass noise			
Contralateral TDH-39 headphone			
Band limit:	1600 Hz (nominal -3 dB point)		
Slope:	The slope is between +12 and +18 dB/octave below 1600 Hz, with an additional ±6 dB tolerance.		
Level:	Overall noise level is indicated in dB HL. Tolerance ±5 dB.		

<b>Contralateral insert earphone and ipsilateral probe</b>	
Bandwidth:	1600 Hz (nominal -3 dB point)
Slope:	The slope is between +12 and +18 dB/octave above 1600 Hz, with an additional $\pm 6$ dB tolerance.
Level:	Noise level is indicated in dB HL. Tolerance $\pm 5$ dB.
<b>Air pressure system</b>	
Range:	Normal +200 to -400 daPa/s. Extended +400 to -600 daPa/s
Pressure sweep rate:	50, 100, 200, 400, 600 daPa/s $\pm 20\%$ in 20% to 80% of the total pressure range
Pressure accuracy:	$\pm 10\%$ or $\pm 10$ daPa, whichever is greatest For probe tones above 226 Hz and volumes below 0.7 cc, additional $\pm 10$ daPa can occur.
Pump measure direction:	Positive to negative or negative to positive
Safety:	Separate safety +530 daPa and -730 daPa $\pm 70$ daPa
<b>Graph units</b>	
Unit of admittance graph Y-axis:	ml, cc, mmho, $\mu$ l
Unit of graph X-axis:	daPa, sec
<b>Device display</b>	
Display:	7 inch, 15:9 WVGA
Resolution:	800 x 480 pixel
<b>USB port connector</b>	
Type:	USB device port
<b>Power supply</b>	
External power supply	XP Power, type AFM60US24
Output:	24 V, 2.5 A
Input:	100-240 V AC, 50-60 Hz, 1.5 A
<b>Power consumption</b>	
Power consumption:	< 70 VA
<b>Operating environment</b>	
Temperature:	+15°C to +35°C (59°F to +95°F)
Air humidity:	10 to 90%, non-condensing
Air pressure:	600 hPa to 1060 hPa
Warm-up time:	< 10 min. If stored in conditions not within specified operating environment conditions, the device must warm up for 24 hour before being put into operation.
<b>Storing and handling</b>	
Temperature:	-20°C to +60°C (-4°F to +140°F)
Relative humidity:	< 90 %, non-condensing
Air pressure:	500 hPa to 1060 hPa
<b>Dimensions (HxWxD)</b>	
Stand-alone version:	190 mm x 248 mm x 261 mm (7.5" x 9.8" x 10.3")
PC-based version:	100 mm x 240 mm x 240 mm (3.9" x 9.4" x 9.4")
<b>Probe dimensions (HxWxD)</b>	
Quick Check probe:	28 mm x 22 mm x 100 mm (1.1" x 0.9" x 3.9")
Diagnostic probe:	10 mm x 10 mm x 25 mm (0.4" x 0.4" x 1.0")
<b>Weight</b>	
Stand-alone version:	2.65 kg/5.85 lb
PC-based version:	1.65 kg/3.64 lb
<b>Optional features (Stand-alone)</b>	
Printer:	Built-in printer. Prints 832 dot line/s on 112 mm paper width
2 cc coupler	
<b>Calibration</b>	
Equipment should be calibrated regularly according to EN 60645-5 and ANSI S3.39	
<b>Essential performance</b>	
MADSEN Zodiac has no essential performance and accordingly, the applicable requirements are as stated in the following:	
1. Impedance/admittance as defined by EN 61027 Type 1, ANSI S3.39 Type 1.	
2. Basic safety as defined by IEC 60601-1.	
All information required by IEC 60601-1-2:2007, #5.2.2.1-#5.2.2.10 is available in the MADSEN Zodiac User Guide.	
<b>Standards</b>	
Safety:	IEC 60601-1, UL 2601-1, CAN/CSA - C22.2 NO 601.1-90 ANSI/AAMI ES60601-1 + AMD 1, CAN/CSA-C22.2 No. 60601-1 MADSEN Zodiac: EN 60601-1, Class II, externally powered, Type BF, IPX0
EMC:	EN 60601-1-2
Impedance/Admittance:	Clinical/Diagnostic: EN 60645-5 Type 1, ANSI S3.39 Type 1
Power supply:	Class I externally powered supply
<b>System requirements</b>	
For system requirements, please refer to the OTOSuite data sheet.	