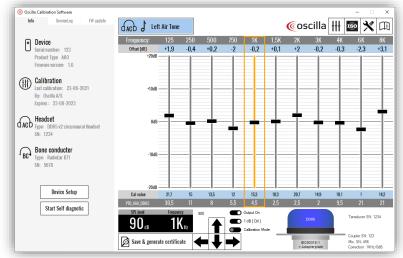


# **Calibration & Repair Guide**

Oscilla<sup>®</sup> A30, A50 and A60 Diagnostic Audiometers English





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Oscilla A/S Åbogade 15 8200 Aarhus DENMARK

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This manual contains instructions regarding safety. Read these instructions carefully and completely before you start to service or calibrate the Oscilla products. If you are uncertain about the use of the software, you are recommended to join a training course, contact Oscilla support for information about this.

# 1. Introduction

This document provides instructions for Calibration of Oscilla® A30, A50 and A60

Feetuwee		Configurations	
Features	Oscilla A30	Oscilla A50	Oscilla A60
Air conduction	•	•	•
Automatic Test	•	•	•
Ear protection Test	•	•	•
SISI Test	•	•	•
Bone Conduction		•	•
Weber Test		•	•
Talk Over			•
Speech Test			•

#### Abbreviations

SPL: Sound pressure level HL: Hearing level software RETSPL: Reference Equivalent Threshold Sound Pressure Level



## 2. Installation

- 1. Install the Oscilla calibration software on the PC.
- 2. Connect the Oscilla device to the computer via USB. Windows automatically detects and installs the device. Wait for the automatic installation to finish.
- 3. Launch Oscilla calibration software.

#### System requirements

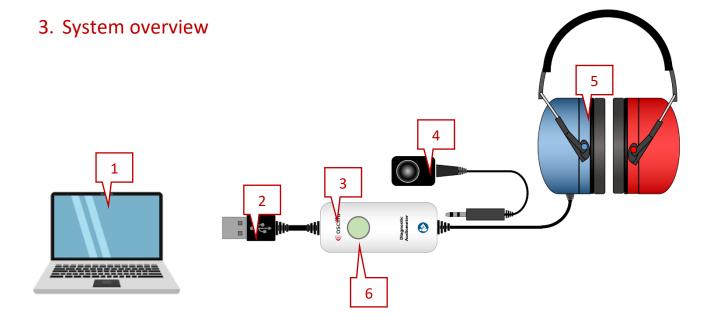
Minimum system requirements

- Processor: 2 GHz
- RAM: 2 GB
- Free space: 150 MB
- Display resolution: 1024 x 600 (1440 x 900 recommended for optimal performance)
- Available USB port for the audiometer
- Available USB port for the operator headset (Only relevant for A60)

#### Supported operating systems

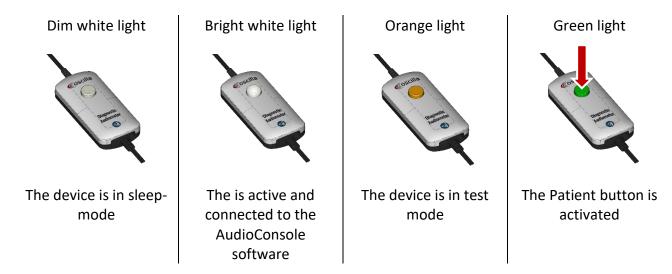
Microsoft Windows 10





- 1. PC with the Oscilla Calibration software.
- 2. USB Plug.
- 3. Main unit.
- 4. Bone conductor (Only A50 & A60).
- 5. Patient Headset.
- 6. Patient response button with status light indicator

#### **Status light indicator**





### Calibration equipment

For calibration of the Oscilla audiometers A30	, A50 & A60, you need following equipment:
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#	Equipment	Standards	Products examples	Need for
1	Sound level meter	complies with IEC60651 class 1 with	BK2250	Oscilla A30
		1/3 octave filters: IEC 61672-1:2002	Norsonic NOR140	Oscilla A50
		class 1		Oscilla A60
2	Artificial ear type with	IEC60318-1	BK4153	Oscilla A30
	adapter plate mounted on		GRAS 43AA	Oscilla A50
	the top			Oscilla A60
3	Sound reference/ Sound	Sound calibrator class 1 according to	Norsonic Nor1256	Oscilla A30
	calibrator	EN/IEC 60942 : 2017 Class 1 and	BK4231	Oscilla A50
		ANSI/ASA S1.40-2006 (R2011).		Oscilla A60
4	Artificial mastoid	IEC 60373 (1990) and meets the	BK4930	Only for
		requirements of the British Standard		Oscilla A50
		BS 4009 (1991) and American National		Oscilla A60
		Standard ANSI S3.13-1987 and ANSI		
		S3.26-1981.		









Sound level meter

Artificial ear

Sound calibrator

Artificial mastoid

Verify that the calibration equipment function as intended and is calibrated before you start calibrating any Oscilla equipment.

Corrections for the microphone and mastoid can be stored in the Oscilla calibration software See section:



# 4. Operation of the calibration & service software

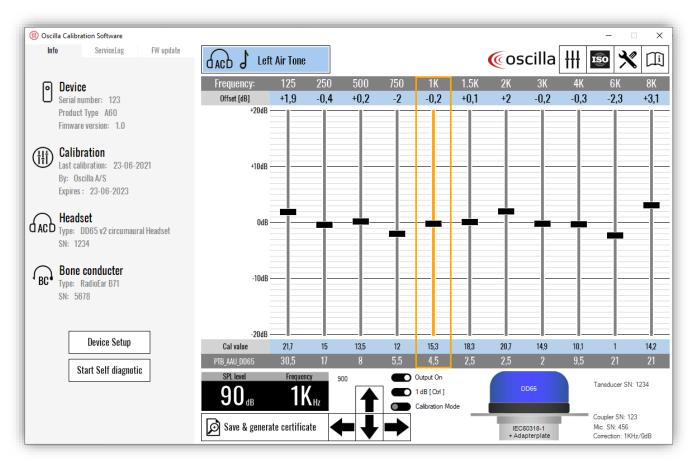


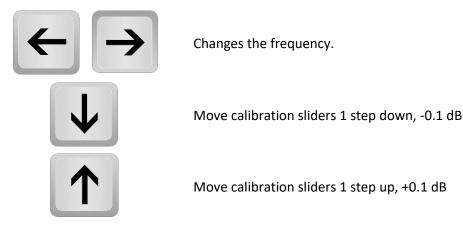
Fig. 1 shows the main screen of the calibration software

#### **Basic operation**

Start the program and connect the audiometer to the USB port. The program will start at 125 Hz, left channel and 90 dB calibration level(SPL), and the tone output will be turned on.

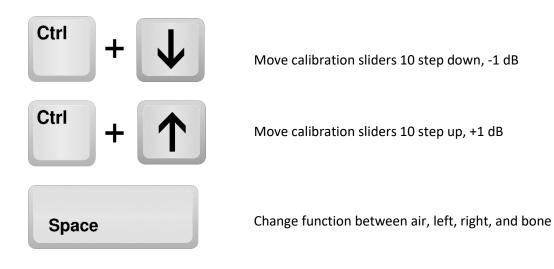
The available buttons that appears in the program depends of which USB audiometer is connected to the PC.

The program can be controlled by the mouse, dragging the sliders and clicking the buttons. However, to make the calibration process more convenient, it can also be controlled by the keyboard.



Id-0334 rev. Calibration manual - EN





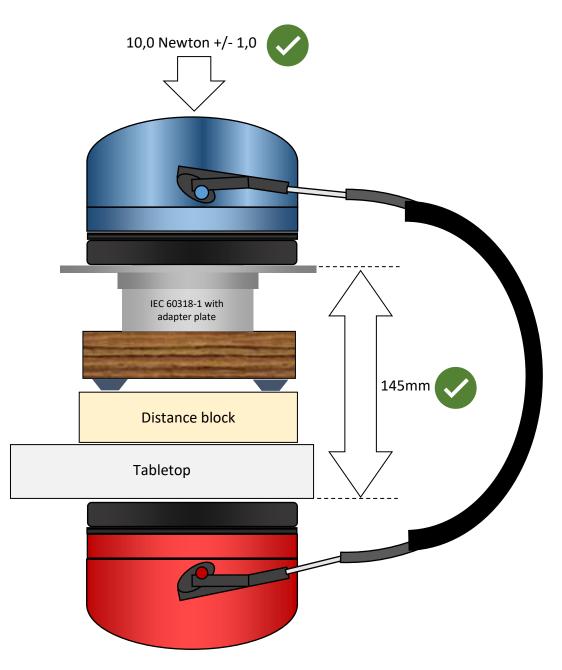
The program automatically detects the audiometer type, and the bone and masking buttons in the top of the main screen and will only be present if the audiometer supports bone and masking. By using the keyboard, you can keep your eyes on the calibration equipment all the time, instead of having to look at the PC monitor to follow the mouse pointer.



#### Preparing calibration of headset

The artificial ear type IEC60318-1 with adapter plate mounted on the top, must be used for calibrating the circumaural headset.

To calibrate correctly, it is important that the circumaural headset is forced down to the plate with 10,0N +/- 1,0N. this can be done by using the force from the headband of the headset, but it requires that the phone are separated with 145mm, we recommend to place it around a table top with a "distance block" to ensure the 145mm, see the illustration below.





#### Air Tone calibration

By means of the 11 calibration sliders, calibrate the sound pressure for the 11 frequencies to the level set in the Calibration Level box. This is 90 dB by default, but may be changed if desired with the Down and Up buttons.

ACD Left Air Tone

Start with "Left Air Tone" and adjust the intensity for each of frequencies.

When left tone calibration is completed you must continue with the masking calibration if the device is a A50 or an A60, else you are able to continue with distortion test for left headphone.

#### Air Masking calibration(Only A50 & A60)

## ACD 🗱 Left Air Masking

Masking calibration is similar to tone calibration, the only difference is the sound output now is narrow band noise instead of the sinus tone, all 11 frequencies must be adjusted to 90 dB SPL.

#### **AIR Distortion test**

The Distortion test is not a calibration, since you are not able to adjust anything, it's only a optional check, to see if the distortion is lower than 2.5% at 80dB HL for 250Hz and lower than 2.5% at 100dB HL for 500Hz. The test is always done by the manufacture, but is optional for service partners in the field. Complete the Distortion test for the left headphone before you change to the right headphone.



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**Distorsion Test** 

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Swap the headset and place the right headphone on the artificial ear and continue the same procedure as the left side starting with Right Air Tone.



Then Right masking if the device is a A50 or A60.



And then the optional distortion test



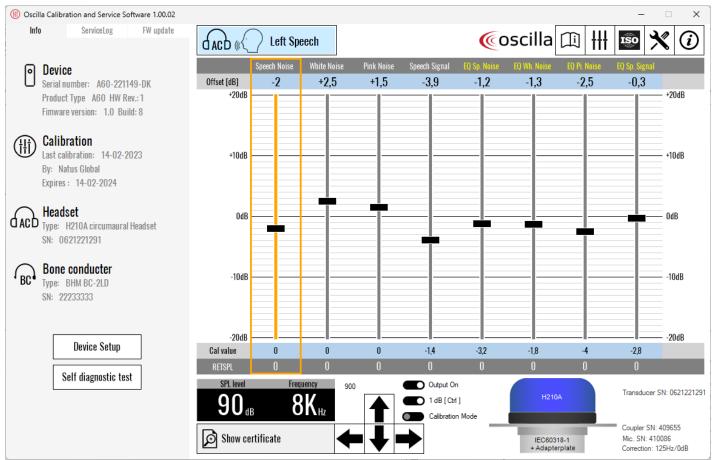




### Speech calibration(Only A60)



Speech test in the Audioconsole software can conducted with or with out equalizing(EQ) so both option must be calibrated, the first four slides to adjust are whit out equalizing, and the last four sliders are whit equalizing. All levels must be adjusted so they reach 90dB.



The slider for speech Signal and the slider for "EQ Speech Signal" are both calibrated with a wav file that will be presented, the signal will be presented in 1 minute, then it will turn of, by moving to another slider, and back again, it will again be presented.



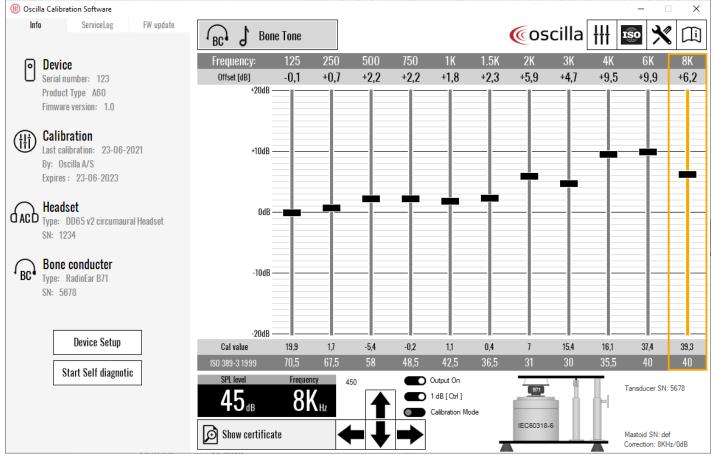
# Preparing calibration of bone conductor(Only A50 & A60)

Use the artificial for calibration of the bone conductor, the placement of the bone conductor on the mastoid can have a big impact on the accuracy of the calibration, must be place precisely in the center of the mastoid.



#### Bone conductor calibration (Only A50 & A60)

The bone conductor calibration is also done with sinus tone output, and are again very similar to the Air Tone calibration, the level for calibration 60 dB SPL on all frequencies except 6000Hz where the target level is 50fB SPL, and the 8Khz where the target level is only 45dB SPL.





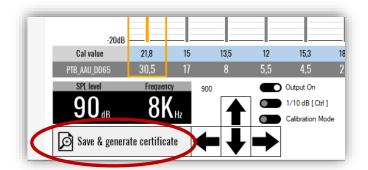
# 5. Calibration certificate

When the calibration is completed, then you must "Save & Generate a calibration Certificate"

Calibration Certificate	
Customer info:	
Calibration certificate format: IEC 60645	ANSI S3.6
Company logo on the certificate:	Signature on the certificate:
€oscilla 🔻	Jushin Boll
Upload new logo	Upload new signature
Save the calibration date into the device ServiceLo	g
Enable warning for next calibration · expires 12	months after this calibration.
Export to PDF, Path: C:\Users\Joachim\Desktop	
Print certificate on the default printer instead of prev	iew.
Cancel	Continue

#### Oscilla A50 & Oscilla A60

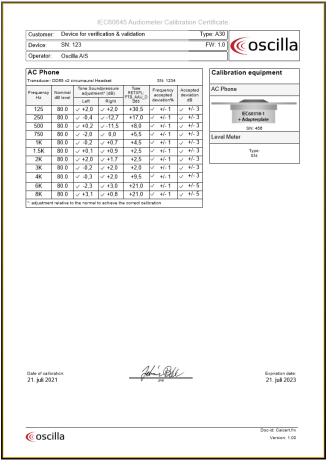
ouotonnon	ustomer: Device for verification & validation							e: A			
Device:	SN: 12	23					F	W: 1	.0	OSC	cilla
Operator:	Oscilla	A/S					-				
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Frequency	Nominal dB level	Tone Sou adjustm		3)	Tone RETSPL:	Frequency accepted	Ma	isking ljustm	pressure ent* (dB)	Masking RETSPL**	Accepted deviation
		Left	Rig	pht	PTB_AAU_DD65	deviation%	Le		Right	REFORE	dB
125	90.0	✓ +2,0	✓ +2		+30,5	✓ +/-1	√+0		√+7,0	+34,5	✓ +/- 3
250	90.0	✓ -0,4	✓ -12		+17,0	✓ +/-1	√+2		√+6,0	+21,0	✓ +/- 3
500	90.0	✓ +0,2	✓ -11		+8,0	✓ +/-1	√+1		√+2,1	+12,0	✓ +/- 3 ✓ +/- 3
750 1K	90.0 90.0	√ -2,0 √ -0.2	√ 0, √ +0		+5,5	√ +/-1	√+0		√ 0,0 √+0.9	+10,5	√ +/- 3
1K 1.5K	90.0	✓ -0,2 ✓ +0,1	✓ +0 ✓ +0		+4,5	✓ +/-1 ✓ +/-1	√+0 √+0		√+0,9 √+2,0	+10,5	√ +/- 3 √ +/- 3
2K	90.0	✓ +0,1 ✓ +2,0	↓ +0		+2,5	√ +/-1 √ +/-1	V+0		v+2,0 v+2.0	+0,5	√ +/- 3
2K 3K	90.0	√ +2,0 √ -0.2	V +1		+2,5	√ +/-1	V 0.		√ +2,0	+0,5	√ +/- 3
4K	90.0	✓ -0,2 ✓ -0.3	✓ +2	- 1 -	+9.5	<ul><li>✓ +/-1</li></ul>	√+0		√+2,0	+14.5	✓ +/- 3
6K	90.0	✓ -2.3	× +2		+21.0	v +/-1	v v+1	.4	√+2,0	+26.0	✓ +/- 5
8K	90.0	✓ -2,3 ✓ +3,1	V +0		+21.0	↓ +/-1	v+1		×+2.0	+26.0	v +/- 5
adjustment	relative to t	he normal to	achieve	the con	rect calibration						
BC Bon	e condu	icter		94, Tabl		BC SN: 5678	]	Ca	libratio	n equipm	ent
BC Bon	e condu RadioEar B7 Nominal	1 Soundpres	sure	RETFL	." RETFL	Accepted	]		libration Phone	n equipm	ent
BC Bone ransducer: I Frequency Hz	e condu RadioEar B7 Nominal dB level	Soundpres	sure	RETFL Masto	rr RETFL*** d Forhead	Accepted deviation dB				n equipm	ent
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Frequency Hz 125 250	e condu RadioEar B7 Nominal dB level 60,0 60,0	Soundpres adjustment +1,5 +1,5 +0,7	sure	RETFL Mastol +70,5 +67,5	rr RETFL*** Forhead 5 +82,5 5 +79,5	Accepted deviation dB $\checkmark$ +/- 3 $\checkmark$ +/- 3			Phone	EC60318-1 Adapterplate	ent
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Frequency Hz 125 250	e condu RadioEar B7 Nominal dB level 60,0 60,0	Soundpres adjustment +1,5 +1,5 +0,7	sure	RETFL Mastol +70,5 +67,5	RETFL***           Forhead           5         +82,5           5         +79,5           0         +72,0           5         +61,5	Accepted deviation dB $\checkmark$ +/- 3 $\checkmark$ +/- 3	-	AC	Phone	EC60318-1 Idapterplate SN: 458	ent
Frequency Hz 125 250 500 750	e condu RadioEar B7 Nominal dB level 60,0 60,0 60,0 60,0	Soundpres adjustment* +1,5 +0,7 +2,2 +2,2	sure	RETFL Masto +70,5 +67,5 +58,1 +48,5	RETFL***           Forhead           5         +82,5           5         +79,5           0         +72,0           5         +61,5           5         +51,0	Accepted deviation dB	-	AC	Phone	EC60318-1 Idapterplate SN: 458	ent
Frequency Hz 125 250 500 750 1K	e condu RadioEar B7 Nominal dB level 60,0 60,0 60,0 60,0 60,0	Soundpres adjustment" +1,5 +0,7 +2,2 +2,2 +2,2 +1,8	sure	RETFL Mastol +70, +67, +58, +48, +48,	RETFL***           Forhead           5         +82,5           5         +79,5           0         +72,0           5         +61,5           6         +51,0           5         +47,5	Accepted deviation dB $\checkmark$ +/- 3 $\checkmark$ +/- 3 $\checkmark$ +/- 3 $\checkmark$ +/- 3 $\checkmark$ +/- 3		AC	Phone	EC60318-1 Idapterplate SN: 458	ent
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3C Bon renaducer: I requency HZ 125 250 500 750 1K 1.5K 2K 3K 4K 6K 8K ■ adjustment + ISO 389-3	e condu RadioEar B7 Nominal dB level dB level 60,0 60,0 60,0 60,0 60,0 60,0 60,0 60,	Soundpres adjustment	sure (dB)	RETFLI Mastai +70,1 +67,1 +58,1 +48,2 +44,2 +31,1 +30,1 +31,1 +31,1 +31,1 +35,1 +40,1 +35,1 +40,1 +10,	RETFL***           Fortward         Fortward           5         +82,5           5         +79,5           5         +61,5           5         +61,5           5         +42,0           5         +43,5           0         +42,0           5         +43,5           0         +51,0           0         +51,0           0         +51,0           0         +51,0           0         +50,0           0         +51,0           0         +50,0	Accepted deviation dB $\checkmark$ +/- 3 $\checkmark$ +/- 5 $\checkmark$ +/- 5		BC	Phone Bone con	EC60318-1 dapterplate SN: 460 ducter 318-6 SN: def SN: def 101072 class 1 SN: SN:	
BC Bond           rransducer:           Transducer:           125           250           500           750           1K           1.5K           2K           3K           4K           6K           8K           adjustment	RadioEar B7           Nominal dB level           60,0           50,0           45,0           crelative to t:           ::1004, Table           ration:	Soundpres adjustment	sure (dB)	RETFLI Mastai +70,1 +67,1 +58,1 +48,2 +44,2 +31,1 +30,1 +31,1 +31,1 +31,1 +35,1 +40,1 +35,1 +40,1 +10,	**         RETFL***           Forhead         Forhead           5         +82,5           5         +79,5           0         +77,0           0         +77,5           0         +42,0           5         +43,5           0         +43,5           0         +51,0           0         +51,0           0         +51,0           0         +50,0	Accepted deviation dB $\checkmark$ +/- 3 $\checkmark$ +/- 5 $\checkmark$ +/- 5		BC	Phone Bone con	EC60318-1 Idapterplate SN: 450 ducter 3186 SN: def 81672 class 1 Type: SN:	
Sc Bonn           rransducer:           rransducer:           125           250           500           750           1K           1.5K           2K           3K           4K           6K           8K           adjustment           150 389-3           Date of calibrit	RadioEar B7           Nominal dB level           60,0           50,0           45,0           crelative to t:           ::1004, Table           ration:	Soundpres adjustment	sure (dB)	RETFLI Mastai +70,1 +67,1 +58,1 +48,2 +44,2 +31,1 +30,1 +31,1 +31,1 +31,1 +31,1 +32,1 +40,1 +10,	RETFL***           Fortward         Fortward           5         +82,5           5         +79,5           5         +61,5           5         +61,5           5         +42,0           5         +43,5           0         +42,0           5         +43,5           0         +51,0           0         +51,0           0         +51,0           0         +51,0           0         +50,0           0         +51,0           0         +50,0	Accepted deviation dB $\checkmark$ +/- 3 $\checkmark$ +/- 5 $\checkmark$ +/- 5		BC	Phone Bone con	EC60318-1 Idapterplate SN: 450 ducter 3186 SN: def 81672 class 1 Type: SN:	F Contraction date:



Before the calibration certificate will be generated, a window will appear, in this window it is possible to add "customer informations, Company logo and a digital signature from the operator.

It is also possible to add a warning to the customer on when the audiometer should be calibrated next time, and at last to export/store the certificate on a specific location. Press "continue" to see calibration certificate.

The calibration certificates for Oscilla A50 & A60 will have both Air and bone calibration values, The Oscilla A30 will only have the Air calibration values, since this device don't have bone conductor.



Oscilla A30



## 6. RETSPL Corrections

The Reference Equivalent Threshold Sound Pressure Level are connected to the transducer, it is possible to se an overview by clicking on the "ISO" icon tin the top menu



The two tables below is all RETSPL corrections, first IEC 60645 and the ANSI S3.6 on the next side:

#### RETSPL: IEC 60645 - 2018

		Air con	duction		E	Bone conductio	n	] [	Aditional c	orrections
	Supra aural	Headphones	Circumaural	Headphones Mastoid vibrator				Air	BC	
Name	TDH-39	DD45	DD65	H210A	B71	B81	BC-2		NBN correct.	BC forhead correct.
RETSPL Source	ISO 389-1 1998	WDH DD45	PTB_AAU_D D65	PTB 4106973	ISO 389-3 1999	ISO 389-3 1999	ISO 389-3 1999		ISO389-4 table 1	ISO389-3 table C.1
125	45	47,5	30,5	34,7	70,5	70,5	70,5	1 [	4	12
250	25,5	27	17	16,5	67,5	67	67,5		4	12
500	11,5	13	8	5,1	58	58	58	1 [	4	14
750	7,5	6,5	5,5	0,9	48,5	48,5	48,5	1 [	5	13
1K	7	6	4,5	3,1	42,5	42,5	42,5	1 [	6	8,5
1.5K	6,5	8	2,5	0	36,5	36,5	36,5	1 [	6	11
2K	9	8	2,5	-2,9	31	31	31	1 [	6	11,5
ЗК	10	8	2	-0,7	30	30	30	1 [	6	12
4K	9,5	9	9,5	9,2	35,5	35,5	35,5	1 [	5	8
6K	15,5	20,5	21	17,8	40	40	40	1 [	5	11
8K	13	12	21	22,3	40	40	40	1 [	5	10
Speech	20	20	20	20				1		
Equipment	IEC60	)318-3	IEC60	318-1		IEC60318-6				

Calibration table according to IEC 60645-1 2017

IEC60318-3 Artificial ear	IEC60318-1 Ear simulator with adapter plate	IEC60318-6 Artificial mastoid
IEC60318-3	IEC60318-1 + Adapterplate	IEC60318-6
1 Inch microphone with a 6cc acoustic coupler(NBS6A) for supra-aural earphones	1/2 Inch microphone with a 2cc acoustic coupler with adapter for circumaural calibration	Mechanical coupler for the measurement on bone vibrators



### RETSPL: ANSI S3.6 - 2018

		Air con	duction		E	Bone conductio	n	Adition
	Supra aural	Headphones	Circumaural	Headphones		Mastoid vibrato	r	Air
Name	TDH-39	DD45	DD65	H210A	B71	B81	BC-2	NBN corre
RETSPL Source	ANSI S3.6 Table 5 R2	ANSI S3.6 Table 5 R3	PTB_AAU_D D65	PTB 4106973	ANSI S3.6 table 8 R1	ANSI S3.6 table 8 R1	ANSI S3.6 table 8 R1	ANSI S3.6 table 4
125	45	47,5	30,5	34,7	70,5	70,5	70,5	4
250	25,5	27	17	16,5	67	67	67	4
500	11,5	13	8	5,1	58	58	58	4
750	7,5	6,5	5,5	0,9	48,5	48,5	48,5	5
1K	7	6	4,5	3,1	42,5	42,5	42,5	6
1.5K	6,5	8	2,5	0	36,5	36,5	36,5	6
2К	9	8	2,5	-2,9	31	31	31	6
3К	10	8	2	-0,7	30	30	30	6
4K	9,5	9	9,5	9,2	35,5	35,5	35,5	5
6K	15,5	20,5	21	17,8	40	40	40	5
8K	13	12	21	22,3	40	40	40	5
Speech	19,5	18,5	17	15,6		•	•	
Equipment	IEC60	)318-3	IEC60	)318-1		IEC60318-6		]

#### Calibration table according to ANSI S3.6 - 2018

Aditional corrections					
Air	BC				
NBN correct.	BC forhead correct.				
ANSI S3.6 table 4	ANSI S3.6 table 8 R3				
4	12				
4	12				
4	14				
5	13				
6	8,5				
6	11				
6	11,5				
6	12				
5	8				
5	11				
5	10				

IEC60318-3 Artificial ear	IEC60318-1 Ear simulator with adapter plate	IEC60318-6 Artificial mastoid
IEC60318-3	IEC60318-1 + Adapterplate	IEC60318-6
1 Inch microphone with a 6cc acoustic coupler(NBS6A) for supra-aural earphones	1⁄2 Inch microphone with a 2cc acoustic coupler with adapter for circumaural calibration	Mechanical coupler for the measurement on bone vibrators



# 7. Correction values for microphone and mastoid

To make the calibration of the audiometer easier, there is an option to type in the frequency-dependent dB-corrections for the microphone and mastoid. This will allow you to calibrate to same SPLs and VFLs for each

frequency. Click on the Settings button in the top menu, and select the "Calibration Equipment" tab.



Select "IEC60318-1" to adjust the corrections for the ½ inch mic. To AC calibration of the circumaural headsets:

Settings					x
Calibration Equip	oment	Licensee	Advanced		
Select type: IEC6	0318-1 Ear simula	or with adapter plate	▼		
		a 2cc acoustic coupler wit 1153 w. Adapter or GRAS	h adapter for circumaural calibr 43AA w. Adapter		IEC60318-1 Adapterplate
Coupler SN:	23				
Microphone Corre Frequency (Hz)	125 25			4K 6K 8K	
Corrections (dB):	0.0 🚖 0.0	◆ 0.0 ◆ 0.0 ◆ 0.0		0 🔹 0.0 🖨 0.0 🖨	
	Cano	el		Save	

Select "IEC60318-6" to adjust the corrections for the mastoid(Bone conductors):

ettings					
Calibration	Equipment	Licensee	Advanced		
Select type:	IEC60318-6 Artific	ial mastoid	•	7	
Description:	Mechanical coupler	for the measurement or	n bone vibrators		
Product exam	nples: Brüel and k	jær 4930		IEC	60318-6
Mastoid SN:	def				
Mastoid Corr	rections:		Use sensitivity fo	rce + Corrections:	
Frequency (H		250 500 750		4K 6K 8K	
Corrections (	(dB): 0,0 🖨	0.0 🗢 0.0 🖨 0.0 🗧		0.0 🗢 0.0 🗢 0.0 🗢	
		Cancel		Save	

The normal corrections for the mastoid will be between -16dB to -20dB, if the certificate for the mastoid only shows very small correction values, then it is because it also show sensitivity force, then you need pus the toggle button "Use sensitivity force + correction" and then type both the small values and the sensitivity force value from the certificate

# 8. Authorized Service Levels

The table below shows which tasks the End users, authorized technicians and Oscilla depot repair are allowed to conduct.

#	Service / repair tasks	End users	Authorized technicians	Oscilla Depot repair
		Level 1	Level 2	Level 3
1	Installation	Yes – Ref. IFU	Yes – Ref. IFU	Yes – Ref. IFU
2	Cleaning	Yes – Ref. IFU	Yes – Ref. IFU	Yes – Ref. IFU
3	Updating the PC software	Yes – Ref. IFU	Yes – Ref. IFU	Yes – Ref. IFU
4	Updating the firmware	No	Yes – Ref. SCM	Yes – Ref. SCM
5	Calibration of the device	No	Yes – Ref. SCM	Yes – Ref. SCM
6	Replacement of the "P-1210 ATM4 Headset cable"	No	Yes – Ref. SCM	Yes – Ref. SCM
7	Replacement of the "P-1211 ATM4 USB cable"	No	Yes – Ref. SCM	Yes – Ref. SCM
8	Replacement of the "P-1202 ATM4 response button"	No	Yes – Ref. SCM	Yes – Ref. SCM
9	Replacement of the "P-1201 ATM4 Enclosure"	No	Yes – Ref. SCM	Yes – Ref. SCM
10	Replacement of the "P-1207 PCB support foot"	No	Yes – Ref. SCM	Yes – Ref. SCM
11	Replacement of the complete headset	No	Yes – Ref. SCM	Yes – Ref. SCM
12	Replacement of the complete bone conductor	No	Yes – Ref. SCM	Yes – Ref. SCM
13	Replacement of complete PCB	No	Yes – Ref. SCM	Yes – ref. procs
14	Replacement of transducer inside headset	No	Yes – Ref. SCM	Yes – ref. procs
15	Replacement of components on PCB	No	No	Yes – ref. procs
16	Warranty repairs	No	No	Yes – ref. procs

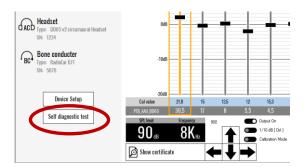
# 9. Final test after repair

#	Туре	Description
1.	Ocular inspection	Cables, Enclosure, Button, Headset, Bone conductor are carefully inspected for breakage, cracks
		and faulty assembly.
2.	Test	Run the "Self-diagnostic test" after any type of service to ensure that the complete system is
		working as intended, see section 10.



# 10. Self diagnostic test

The ATM4 audiometers have a onboard "Self diagnostic test" system that can find errors on the system. The test should be used after any type of service to ensure that the complete system is working as intended. All ATM4 audiometers must pass this test as a part of the production. The "Self diagnostic test" can be started from the calibration software



#### Start the test with or whit out the bine conductor connected

III Self diagnostic test			$\mathbf{\lambda}$		- 🗆 ×	
Teststant 1:Level, Heft-1,8dB Min:-3dB Max:0dB Pass 2:Distotion, kett:0,15% Min:0% Max:0,7% Pass	Start Full test with Bo	one Sta	rt test with out Bone	Start PCB t	est, No transducers	
3: level, right: -1,8dB Min: -3dB Max: 0dB Pass 4: Distortion, right: 0,16% Min: 0% Max: 0,7% Pass		Left AC	Right AC	Bone(From Left)	Bone(From Right)	
5 level home [from left]-1,1d8 Min:-3d8 Max-048 Pass 6 bitotion, bone (from left):0,51% Min: 0% Max 1/6 Pass 7 level, bone (from ight):0,1d8 Min:-3d8 Max-048 Pass 8 bitotion, bone (from ight):0,43% Min: 0% Max:1% Pass 9 Level left, output to bone 6 indhe: 62,7d8 Min:-20048 Max:-5048 Pass	Distorstion	Max: 0,7% 0,15% V Min: 0%	Max: 0,7% 0,16%	Max: 1% 0,51% 🗸 Min: 0%	Max: 1% 0,49%	
10 Level, jöght, öutput toleft & Done - 62,348 Min - 20048 Max -5048 Pass 11: Level, bone, output toleft & right - 46,848 Min - 20048 Max -4048 Pass 12: Lowievel, jöght - 30,469 Min - 32,46 Max -3048 Pass 13: Lowievel, jöght - 31,46 Min - 32,46 Max - 3048 Pass 14: Current Ivel (41: 55,468 Min - 1248 Max - 3048 Pass	Level	Max: 0dB -1,8dB ✓	Max: 0dB	Max: 0dB	Max: 0dB	
15 Current distortion, lett. 0,26%, Mirc 0,3 Max 0,7%, Pass 16 Current level, right: 9,568 Mirc 1248, Max: 8,88 Pass 17 Current distortion, right: 0,33%, Mirc 0,% Max: 0,7%, Pass 18 Current et distortion, Dave 10,00, Mirc 13, Max 2, 164 19 Current distortion, Dave 10,00, Mirc 13, Max 2, 164	Level Out to Bone	Max: -50dB -62,7dB	Max: -50dB -62,3dB Min: -200dB	Max: -40dB		
20 Frequency response filmess, left: 0.8dB Min: 0.8B Mars. 1,5dB Pass 21. Frequency response filmess, light: 0.8dB Min: 0.0B Mars. 1,5dB Pass 22. Frequency response filmess, lone: 2,5dB Min: 0.0B Mars. 3,5dB Pass 23. DC level, direct: 1,511 V Min: 1,58V Mars. 1,58V Pass 24. DC level, presence: 1,527 W Min: 1,58V Mars. 1,58V Pass	Low Level	Max: -30dB -30,9dB 🗸 Min: -32dB	Max: -30dB -31dB 🗸 Min: -32dB			
25: DC level, preamp, +2048: 1,622V Min: 1,58V Max: 1,65V Pass 26: USB supply voltage: 4,948V Min: 4,75V Max: 5,25V Pass 27: Bet hef calibration, light: -2,564B Min: -1,54B Max: 1,54B Fail 28: Get hef calibration, light: -2,564B Min: -1,568 Max: 1,548 Fail	Current Level	Max: -8dB -9,5dB	Max: -8dB -9,6dB Min: -12dB	Max: -2dB -48dB X Min: -15d8		
est end	Current Dist Distorstion	Max: 0,7% 0,36% V Min: 0%	Max: 0,7%	Max	2% 100% X	
100%	Frequency Response	Max: 1,5dB 0,8dB 🗸 Min: 0dB	Max: 1,5dB 0,8dB 🗸 Min: 0dB	Max: Min:	2,5dB 🗸	
PCB Hardware Id: 2059ALG21013052 Show or Print TestReport	Ireference Calibration	-2,56dB Min: -1,5dB	Max: 1,5dB -2,56dB Min: -1,5dB			
			DC Le	evels		
Î	DC Level Direct	Max: 1,65V 1,611V V Min: 1,58V		DC Level PreAMP	Max: 1,65V 1,621V Min: 1,58V	
	USB Supply Voltage	Max: 5,25∨ 4,948V ✓ Min: 4,75∨		DC Level PreAMP	Max: 1,65V <b>1,622V</b>	

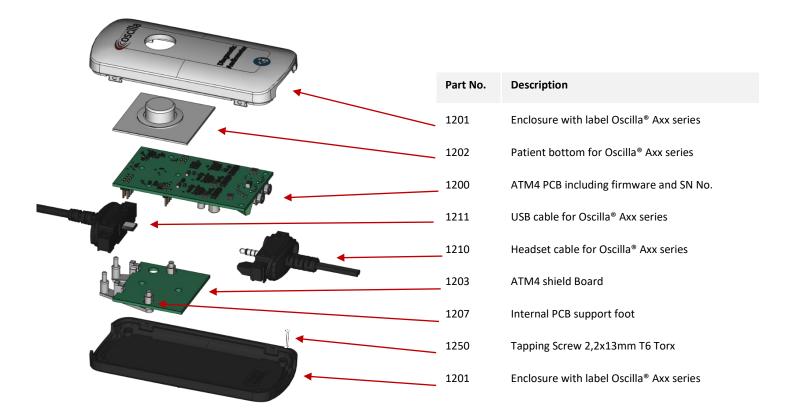
#### The result can be printed or stored as a pdf file as evidence for the test result

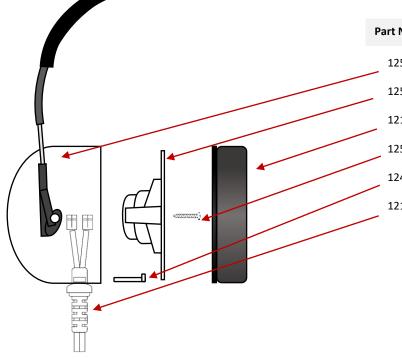
	Left AC	Right AC	Bone/From Left)	Bane(From Right) Mec 1%	
Distorstion	0,15% 🖌	0,16% 🗸	0,51% 🗸	0,49% 🗸	
Level	Mac DB -1,8dB 🗸 Mac 348	Mex 018 -1,8dB √ Min.338	-1,1dB 🗸	Max 045 -1,1dB 🗸 Max -345	
Level Out to Bone	62,7dB	-62,3dB 🗸	Max	6,8dB 🖌	
Low Level	58ec -3068 -30,9dB √ 56c -3048	-31dB 🗸			
Current Lovel	Mex -843 -9,5dB 🗸 Mit -5248	Mec -0+0 -9,6dB -/ Mrc -1349	Mitt -	48dB ×	
Current Dist Distoration	Max: 0,7% 0,36% 🖌 Mrc 9%	Nex: 0.7% 0,33% 🗸 Min: 0%	Mex	100% 🗙	
Frequency Response	Max: 1.5c3 0,8dB 🗸 Mec Das	Nex 1.508	Max: Mec	2,5dB 🖌	
Ineference Calibration	-2,56dB	-2,56dB			
	Max 1657	DCI	ovels	Max 1,05V	
DC Level Direct	1,611V V Max 6.30V		DC Level PreAMP	1,621V -	
USB Supply Voltage	4,948V 🖌		DC Level PreAMP	1,622V 🖌	



## 11. Repair & Service

#### Service parts





No.	Description
253	Oscilla® H210A Headset whit out transducers
254	Oscilla <sup>®</sup> H210A Transducer
214	Cushion set for Oscilla <sup>®</sup> H210A Headset
250	Tapping Screw 2,2x13mm T6 Torx
248	Internal CableLock for H210A Headset
210	Headset cable for Oscilla® Axx series



# Service tools for the A-series



Service must only be provided by service technicians that are trained and authorized by Oscilla A/S, Denmark.



# 12.

# Symbols



Manufacturer



Serial number



Catalogue/product number



Caution



Follow instruction for use



Consult instruction for use



Type B applied part



Direct current



Medical device according to Medical Device Directive 93/42/EEC.



Humidity limitation



Atmospheric pressure limitation



Temperature limit



The device must be recycled or disposed of in a proper manner in accordance with the WEEE Directive 2012/19/EU.



Do Not Use if Package is Damaged symbol.

Id-0334 rev. Calibration manual - EN



#### Manufacturer 13.



Åbogade 15 DK-8200 Aarhus N Phone: +45 61 72 81 70 Website: www.oscilla.dk Mail: info@oscilla.dk

#### Responsibility of the manufacturer

The manufacturer is only responsible for the safety, reliability and performance of the device if:

- All assembly operations, extensions, re-adjustments, modifications, service, calibration or repairs are carried out by the • device manufacturer or by personnel authorized by the manufacturer.
- The electrical installation, to which the device is connected, complies with EN/IEC requirements. •
- The device is used in accordance with the instructions for use. •

The manufacturer reserves the right to waive all responsibility for the operating safety, reliability and performance of devices serviced, calibrated or repaired by unauthorised parties.



# 14. License for Oscilla calibration software

All right to the calibration software belongs to Oscilla A/S, only authorized service partners with the necessary training can be issued a license to borrow the calibration software from Oscilla A/S.

The use of the Oscilla Calibration software is exclusively for Authorized service partners with a valid activation license key. Authorized service partners are not allowed to:

- Misuse the Oscilla calibration software.
- Distribute Oscilla calibration software under your own brand.
- Install the Oscilla calibration software on non-company PCs.
- Share the Oscilla calibration software with third parties.

Violation of the terms above will be met with legal action from Oscilla A/S.

In case of liquidation, merge or any situation where preconditions for this agreement changes, Oscilla A/S reserves the right to withdraw the license without notice.

The name Authorized service partners that have the licensee to use the software can be found in the settings window in the "Licensee" tab

Calibration Equipment	Licensee	Advanced		
		Dscilla Calibration Software 5.00 Release date: 1th November 2021		
		Copyright 2021, Oscilla A/S		
		This software is registered to: Your Comany Name		
Activation keys:				
	PvAxI6EVMjg9y3h6uJ+Kilhpw	AT1AtrLfISFhLyAnweboEx+DP3	Add key	
			Copy key	
			Delete key	
L				

