Ray-On manual

For column model

R-mini

Active audio
L'acoustique active

CE

Identification number : 1438

Active Audio
8 Rue Johannes Gutenberg,
44340 Bouguenais, France

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1438-CPR-0337

EN 54-24:2008
Type B

Loudspeaker for voice alarm systems for fire detection systems and fire alarm in buildings

RayOn models
Rmini-b, Rmini-w, R70TC-w, R70TC-b, B70TC-b, B70TC-w R110TC-w, R110TC-b, R210TC-w, R210TC-b

EU Conformity declaration

CE

We, Active Audio SAS

8 rue Johannes Gutenberg

44340 Bouguenais

France

Hereby declare under our own responsibility that the following product:

Type : 70/100V Loudspeaker

Range : Ray-On

Model : Rmini

Is in conformity with the directive :

2014/35/UE ("Low Voltage")

In respect of the following norms and standard:

EN62368-1 (October 2014)

and with the directive

2014/30/EU (Equipment EMC)

In respect of the following norms and standard:

EN55020/2007+A12/2016

Bouguenais, 06th of June of 2022,

Mr Mathieu POBEDA, Technical Director

Table of contents

1 General presentation

The Ray-On column loudspeakers are passive and based on the DGRC principle. The range includes three columns models, and a proximity speaker:

- R70, height 70cm ;
- R110, height 1,1m ;
- R210, height 2,1m ;
- Ray-On Mini, proximity speaker.

This technical manual is for Ray-On Mini. A specific technical manual is available for the R70TC, R110TC and R210TC columns loudspeakers.

The Ray-On Mini is a proximity speaker dedicated mainly to voice reinforcement and ambient music in small venues.

Made of aluminum, Ray-On loudspeakers can be installed outdoor. They are suited for airports, railway stations, churches, conference rooms, shopping malls, amusement parks, etc.

The Ray-On Mini speakers are compliant with standard EN5424 type B. They can be used in PA systems for safety announcements.

2 Positioning

The most important parameter for the installation of Ray-On loudspeaker is its mounting height because the range of the column directly depends on it.

Table 1 gives the minimum, maximum, and nominal values for Ray-On Mini mounting height [1].

		Hauteur de pose		
		Minimale	Nominale	Maximale
Ray-On Mini	Standing audience	1.90m	2.10m	2.50m
	Seated audience	1.50m	1.80m	2.20m

Table 1 – Ray-On Mini mounting height, from floor to bottom of column (meters).

3 CAD modeling

There are powerful CAD software tools that can predict the acoustics of a room and accurately model the radiation of loudspeaker arrays. These tools can calculate various acoustic indices, such as reverberation time, sound pressure level, STI, etc.

The sound radiation of the Ray-On loudspeakers can be predicted directly using CATT-Acoustic or EASE softwares.

A simple direct sound simulation tool is directly accessible on www.activeaudio.fr.

Direct sound prediction is also given in the technical characteristics section page 8.

1. Ears are at 1.15m from floor for a seated audience, 1.55m for a standing audience.

4 Equalization and tuning

Ray-On loudspeakers may be used without any equalization, but using one is advised. Equalization flattens the column's frequency response and protects the loudspeakers by filtering low frequencies.

Two equalizations are specified:
- one for speech, which uses 4 cells (n°2-5);
- the other for music, which uses 6 cells (n°1-6).

The table 2 gives detailed information about these equalizations. The corresponding frequency curves are presented in figure 1.

	Type	Paramètres
1	Parametric	Freq = 100 Hz ; Gain = +6 dB ; Width = 1.5 oct (Q=0.92)
2	2nd order high-pass	Fcut = 130 Hz ; -3dB @ Fcut (Butterworth)
3	Parametric	Freq = 190 Hz ; Gain = -3.0 dB ; Width = 0.4 oct (Q=3.6)
4	High-Shelv	Freq = 1800 Hz ; Gain = -5.0 dB
5	Parametric	Freq = 3600 Hz ; Gain = +5 dB ; Width = 0.5 oct (Q=1.3)
6	Parametric	Freq = 15 500 Hz ; Gain = +6.0 dB ; Width = 0.5 oct (Q=1.2)

Table 2 – Recommended equalization. Voice cells 2-5. Music cells 1-6

If a subwoofer is used, it is advised not to activate the cell 1, frequencies under 180Hz being rendered by the sub.
This allows the columns to not be driven with important levels of low frequencies.

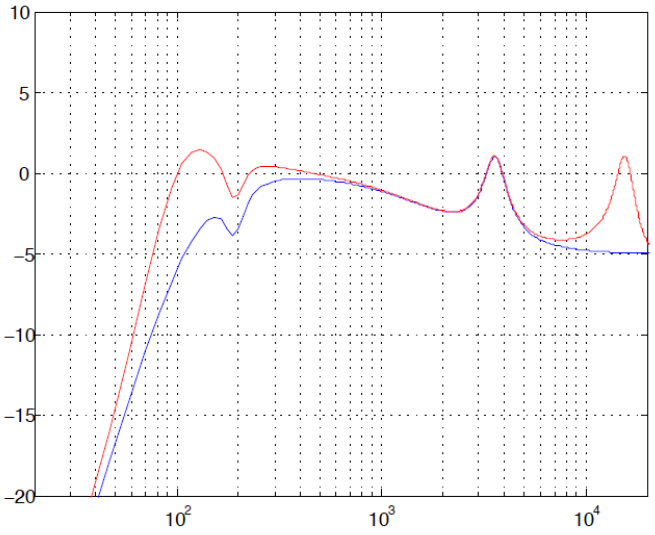
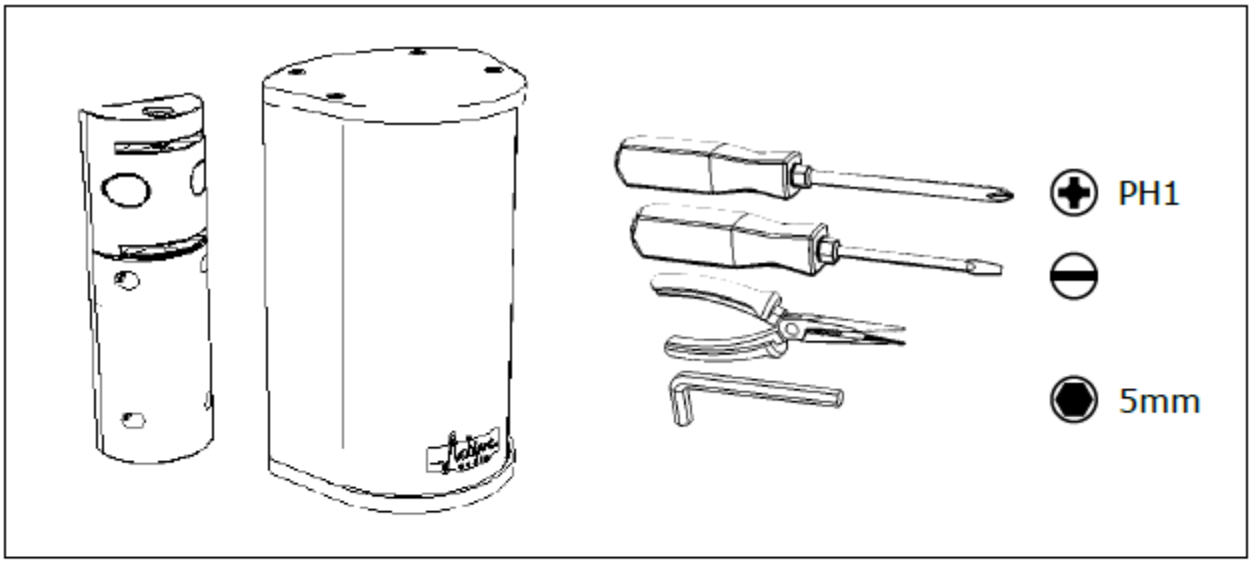
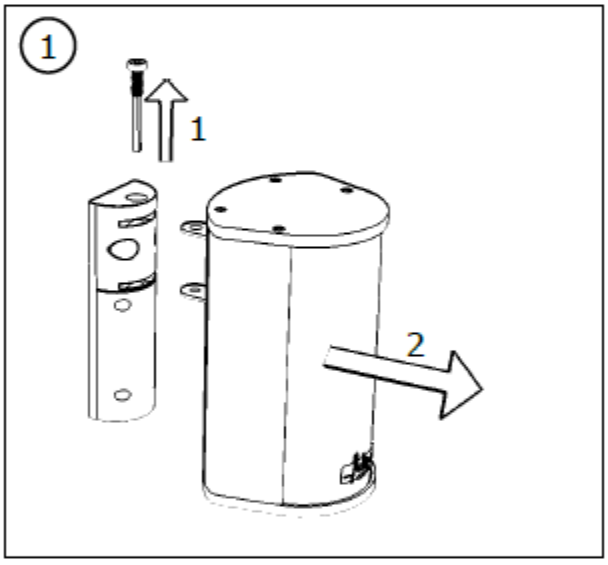


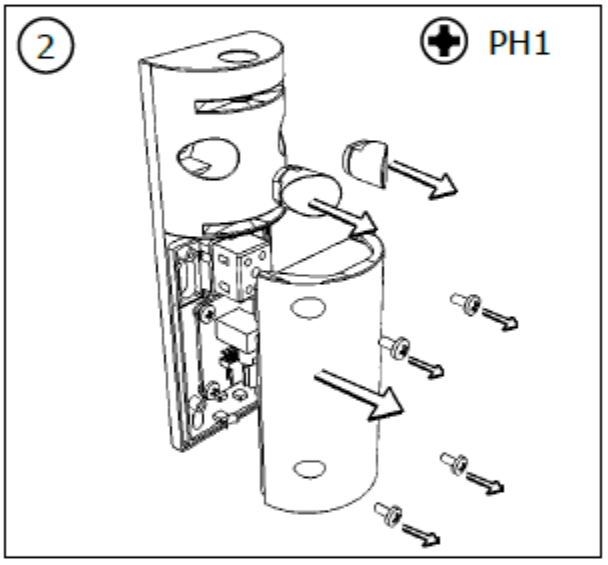
Figure 1 – Recommended equalization curve with (red) and without (blue) cells n°1 and n°6.

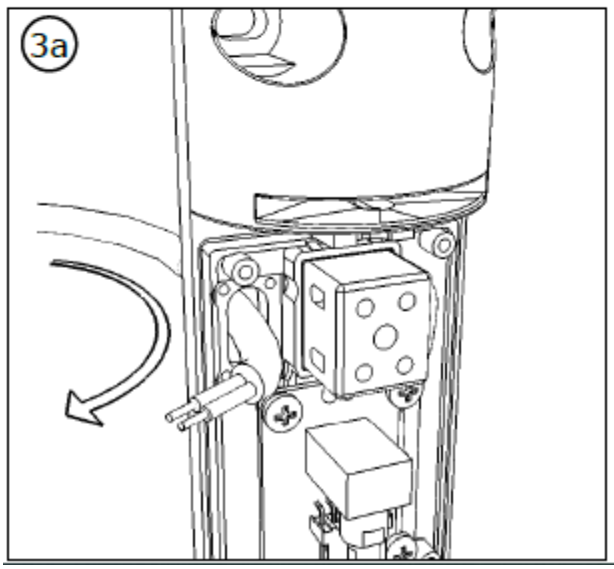
5 Installation et câblage

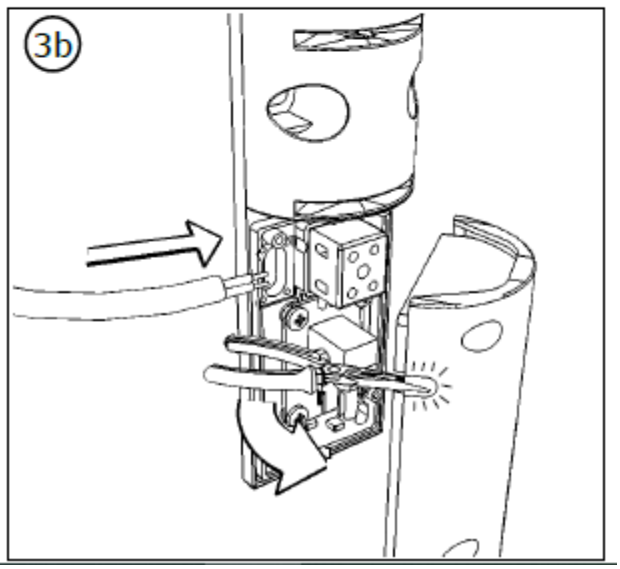
Ray-On loudspeakers are vertically mounted, usually on a wall, using the supplied wall-mounting system. The previous two pages illustrate the steps to follow for column mounting.

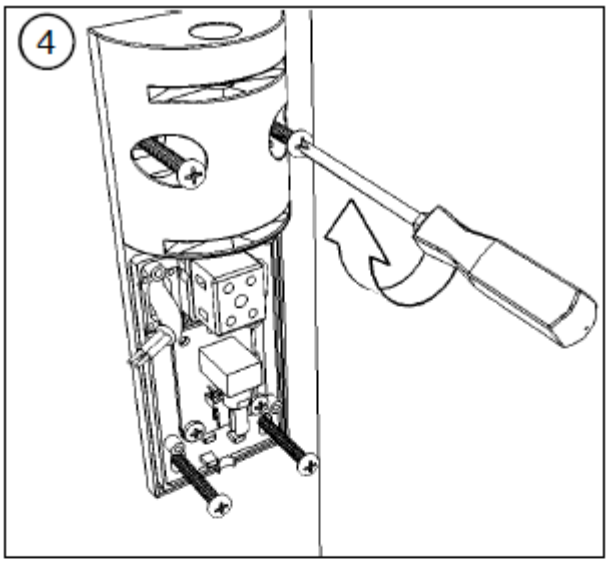








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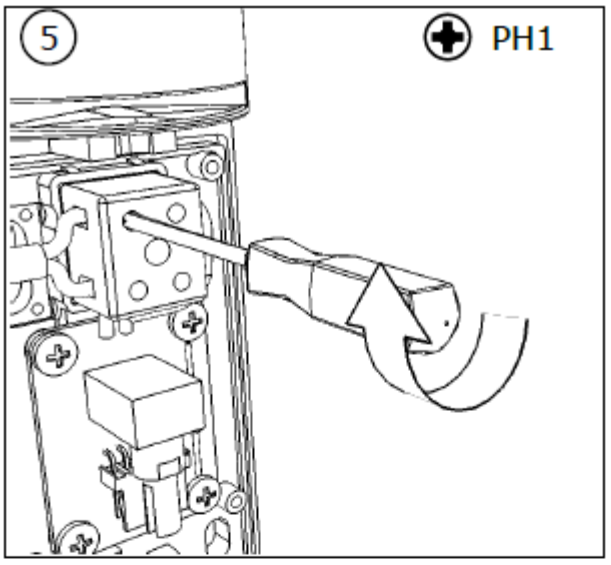
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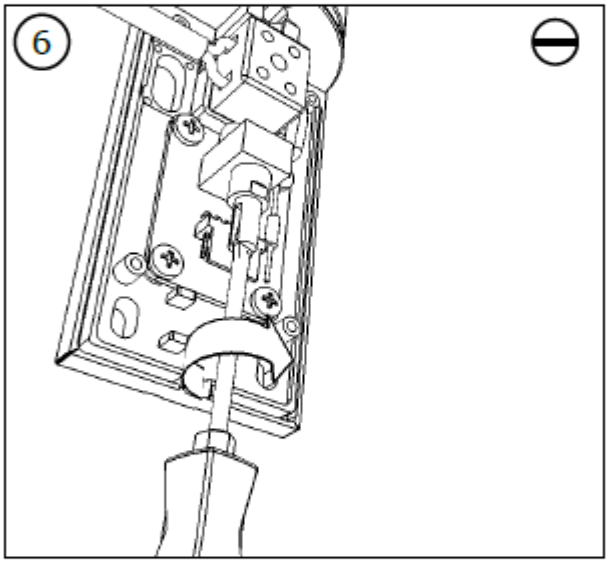
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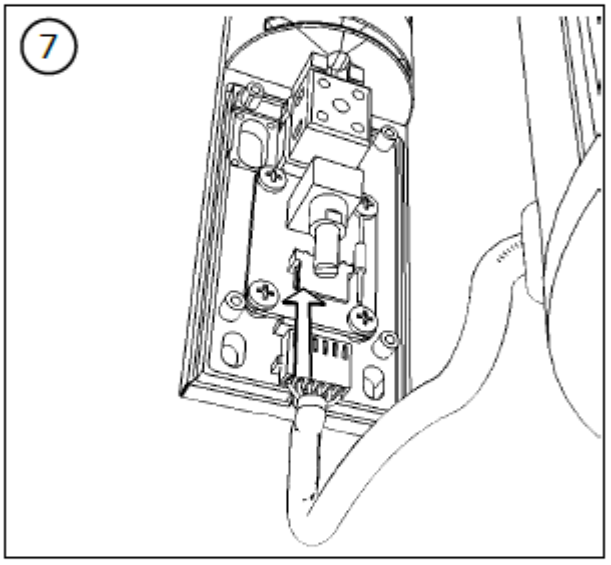
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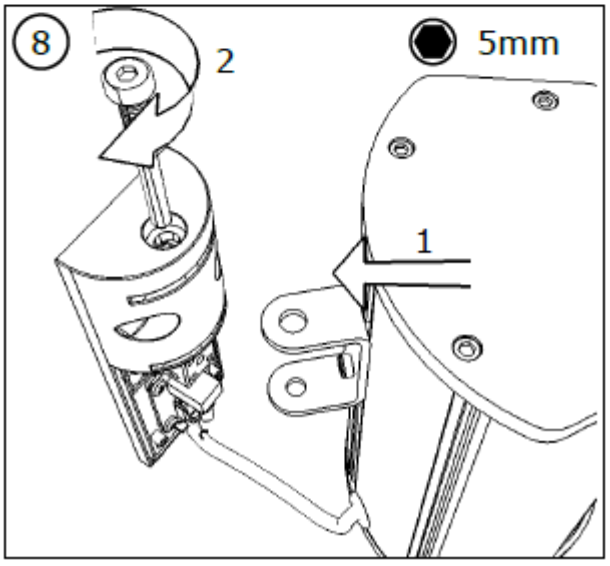
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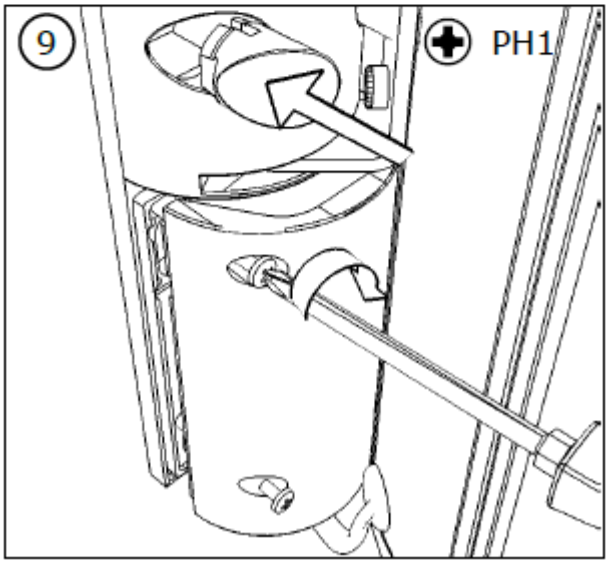
2
5mm
1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PH1

6.1 General characteristics

	Ray-On Mini	
Acoustical data [2]	8Ω mode	100V mode
Continuous power	30W	7.5W / 15W / 30W
SPL Max	97dB at 1m	91 / 94 / 97dB at 1m
Sensitivity	84dB / W at 1m	
Freq bandwidth at -3dB/-10dB	150Hz - 16,5kHz / 120Hz - 18kHz	
Horizontal -6dB opening angle	280° à 500Hz / 180° à 1kHz 180° à 2kHz / 160° à 4kHz	
Vertical -6dB opening angle	135° à 500Hz / 85° à 1kHz 40° à 2kHz / 30° à 4kHz	
Loudspeakers	2 loudspeakers 70x70mm, outdoor	

Electrical data	8Ω mode	100V mode
Nominal impedance	6 Ω	1333 / 667 / 333 Ω
Connectors	"loop-through"	
Wire section	from 0,5 to 2,5mm²	
Protection	Thermal fuse	

Mechanical data	8Ω mode	100V mode
Materials	Body : aluminium ; Grid : steel treated against rust and UV	
Dimensions H x L x P	192 x 128 x 117 mm	
Net / shipping weight	2 / 2.7 kg	
Environment	IP55 ; -25°C to +55°C, indoor / outdoor	
Colors	White (RAL9016 paintable) et Black (RAL9005)	
Mounting	Vertical mounting	

Tuning and exploitation	8Ω mode	100V mode
Mounting height (cm)	1.80 seating / 2.10 standing	
Recom. equalization	Speech : 4 parametric cells / Music : 6 parametric cells	
Models	EASE and CATT-Acoustic models	

2. Unless specified otherwise, characteristics are measured with column at nominal mounting height on horizontal reflecting floor, and using recommended music equalization.

Miscellaneous	8Ω mode	100V mode
Warranty	5 years	
Maintenance	No maintenance required	
Serial number	YYMMXXXX (YY : année - MM : mois - XXXX : série)	
Certification	EN54-24 type B for indoor and outdoor VA systems	

6.2 Technical drawings

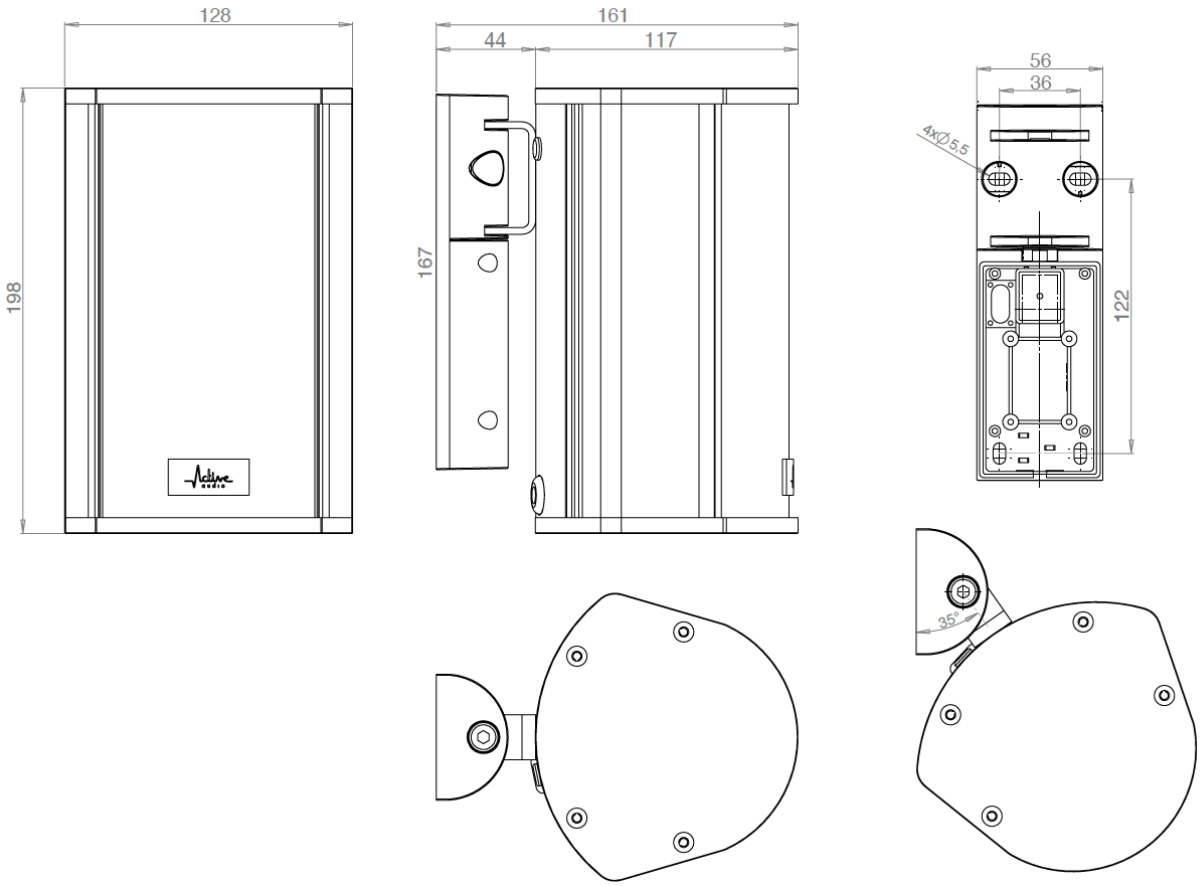
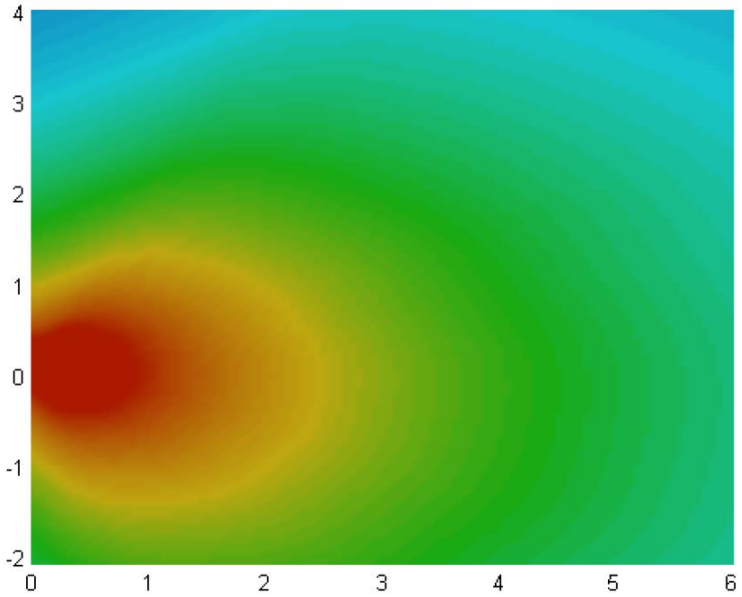


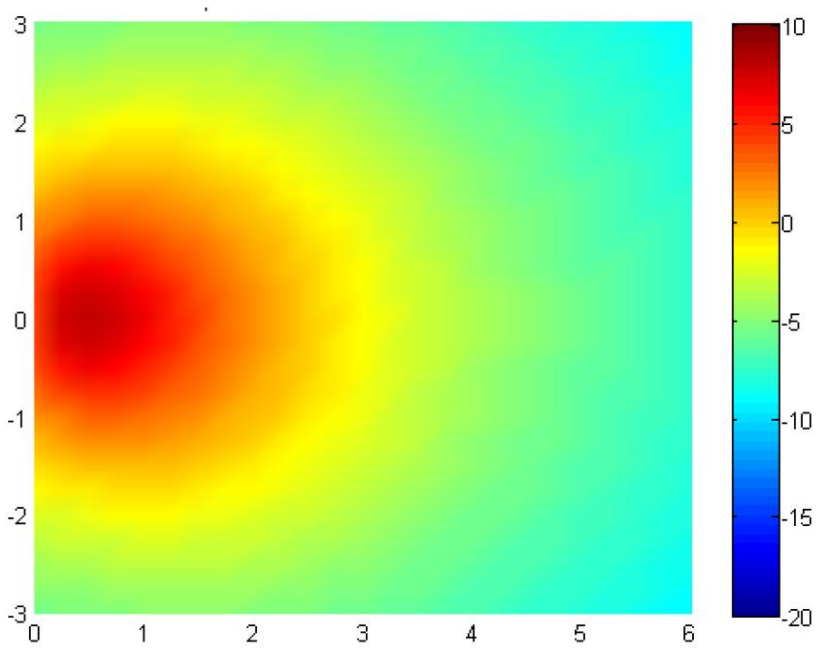
Figure 2 – Technicals drawings

6.3 Acoustical data

Caractéristiques acoustiques [3].



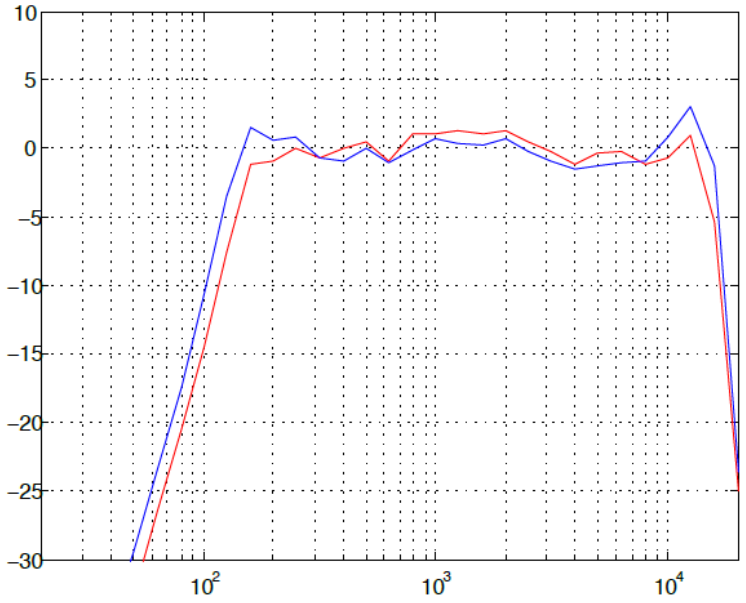
(a) Ray-On Mini vertical directivity: sound level for the speech octaves (500Hz,1kHz,2kHz) in the vertical median plane.



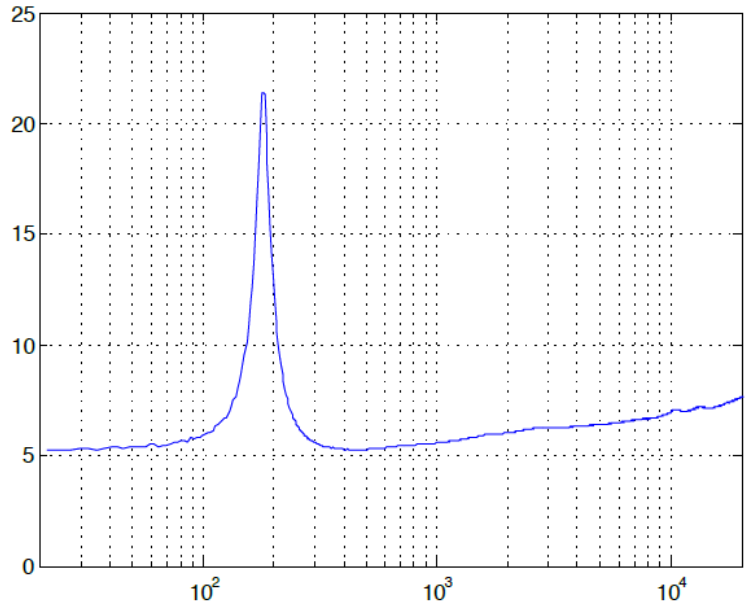
(b) Ray-On Mini horizontal directivity: sound level for the speech octaves (500Hz,1kHz,2kHz) on the listening plane (60cm below the column).

Figure 3 – Ray-On Mini : acoustical data

3. Speaker in nominal position. The reference SPL is the mean level in the listening zone.

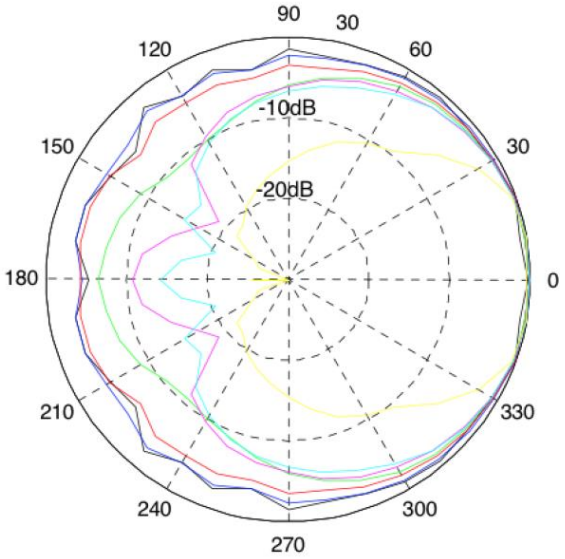


(a) Ray-On Mini frequency response, with recommended music equalization. Average from 2 to 5m in the axis.

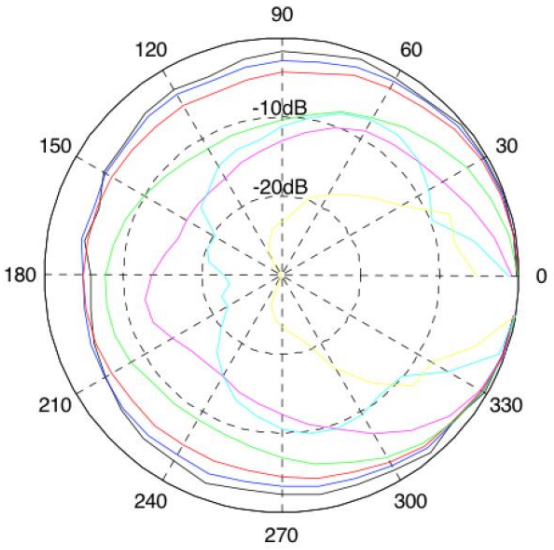


(b) Impedance curve.

Figure 4 – Ray-On Mini : impedance and frequency response



(a) Polar diagram of the horizontal directivity.



(b) Polar diagram of the vertical directivity.

Figure 5 – Ray-On Mini : polar diagrams

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