



# Ray-On

## manual

  
active  
audio  

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L'acoustique active



**DECLARATION OF CONFORMITY**

We,  
ACTIVE AUDIO Sarl,  
332 Boulevard Marcel Paul 44800 St Herblain, France,

Acknowledge our sole responsibility, that the product:  
RAY-ON 100,  
References R100w, R100b, R100Tw, R100Tb

In accordance with EMC directive 2004/1028/CE  
is in compliance with the following norms or documents:  
EN50081-1, EN61000, EN 60065

Established: 14 September 2011  
By: Régis CAZIN, Managing Director

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## 1 General Presentation

Ray-On 100 is a 1 meter high passive column loudspeaker based on the DGRC principle. Using the DGRC principle ensures an optimal sound coverage and intelligibility on the listening zone; it is illustrated in figure 1. This column loudspeaker range is 12 to 20 m, depending on the mounting height (see section 2).

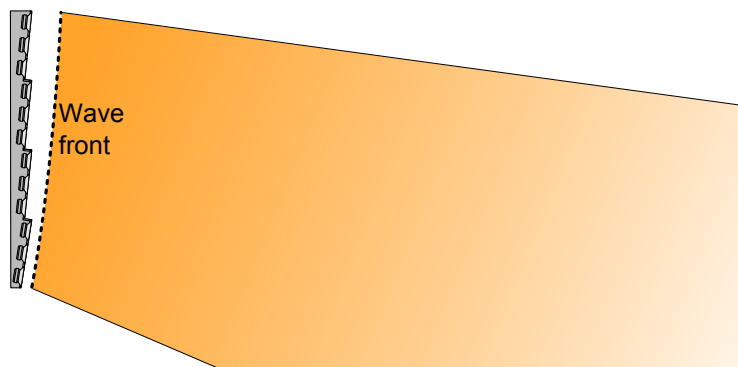


Figure 1: DGRC principle illustration

Ray-On 100 is ideal for sound reinforcement of voice in medium to large spaces where the listening zone is horizontal (slope <math>< 5^\circ</math>). Made of aluminum, Ray-On 100 can be installed outdoors thanks to its tropicalized loudspeakers. It fits airports, railway stations, churches, conference rooms, shopping malls, amusement parks, etc.

The innovative hanging system allows an easy and discrete vertical mounting which, associated with Ray-On 100 elegant design preserves the identity and aesthetics of prestigious places.

Ray-On 100 is available in two versions:

- **R100**: low impedance ( $8\Omega$ )
- **R100T**: 100V version dedicated to installations needing long cable lengths or where several columns are associated on the same line.

## 2 Positioning

The most important parameter for Ray-On 100 installation is its mounting height because the range of the column directly depends on it.

Figure 2 on the facing page shows the  $\pm 5\text{dB}$  range according to the mounting height, for the direct field<sup>1</sup> voice spectrum (300Hz-3kHz).

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<sup>1</sup>Taking the reverberated field into account minimize the influence of the floor's material.

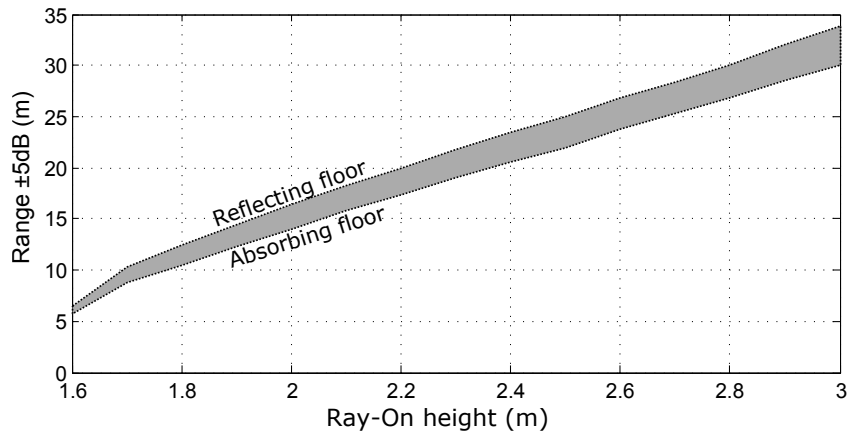


Figure 2:  $\pm 5$ dB range according to mounting height (from floor to bottom of column).

Table 1 gives the minimum, maximum, and nominal values for Ray-On 100 mounting height<sup>2</sup>.

	Mounting height		
	Minimal	Nominal	Maximal
Standing audience	1.65m	2.30m	2.65m
Seated audience	1.25m	1.90m	2.25m

Table 1: Ray-On 100 mounting height, **from floor to bottom of column** (meters).



The Ray-On 100 hanging system allows the subsequent adjustment of the column height.

### 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 100 can be predicted directly using CATT-Acoustic or EASE softwares.



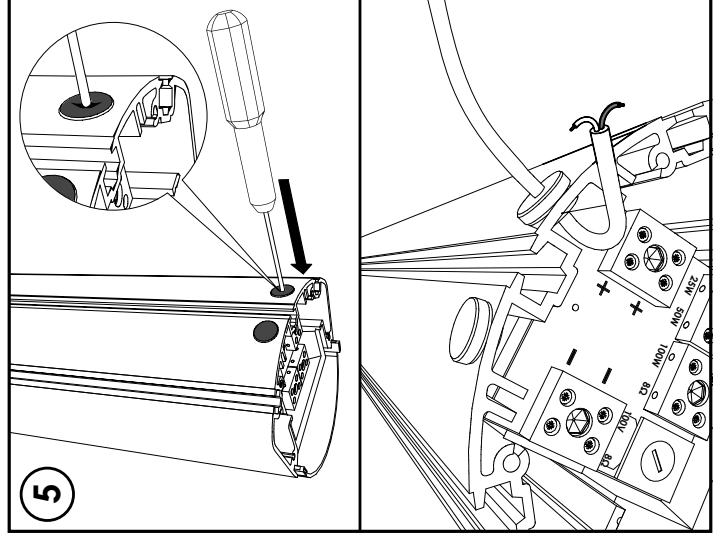
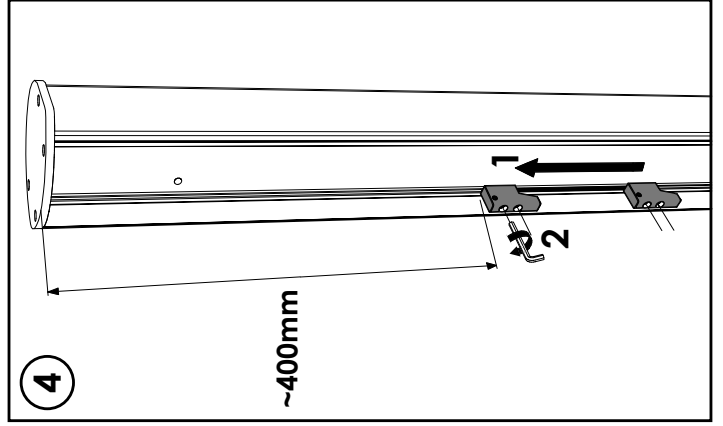
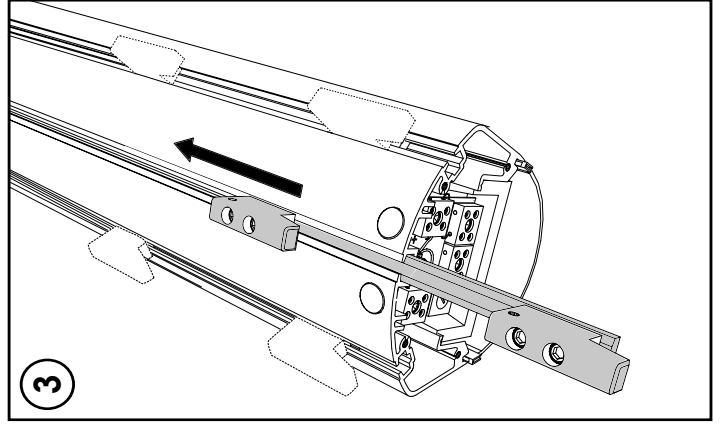
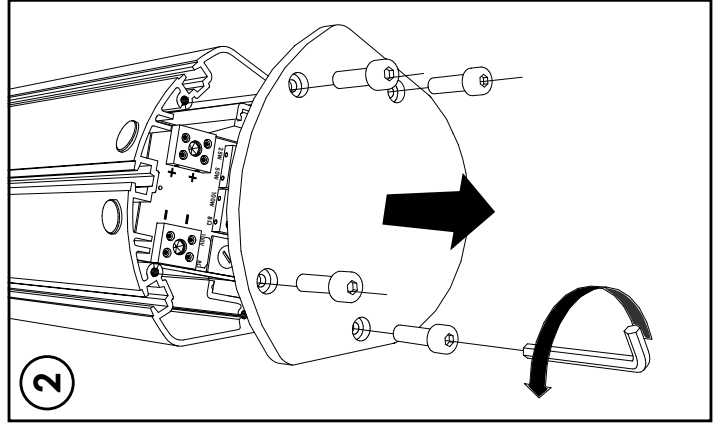
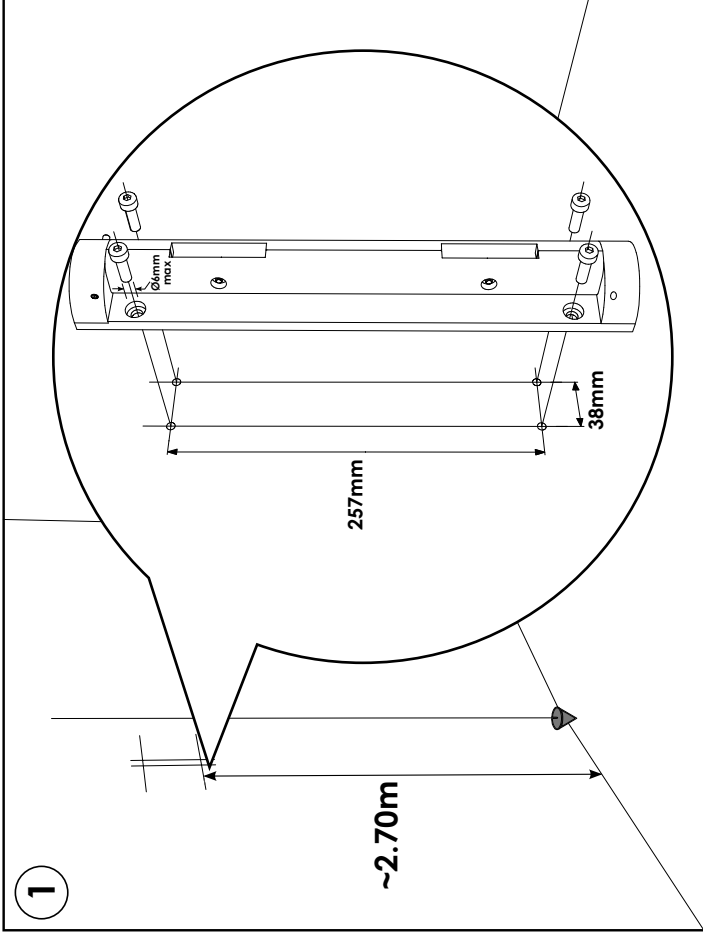
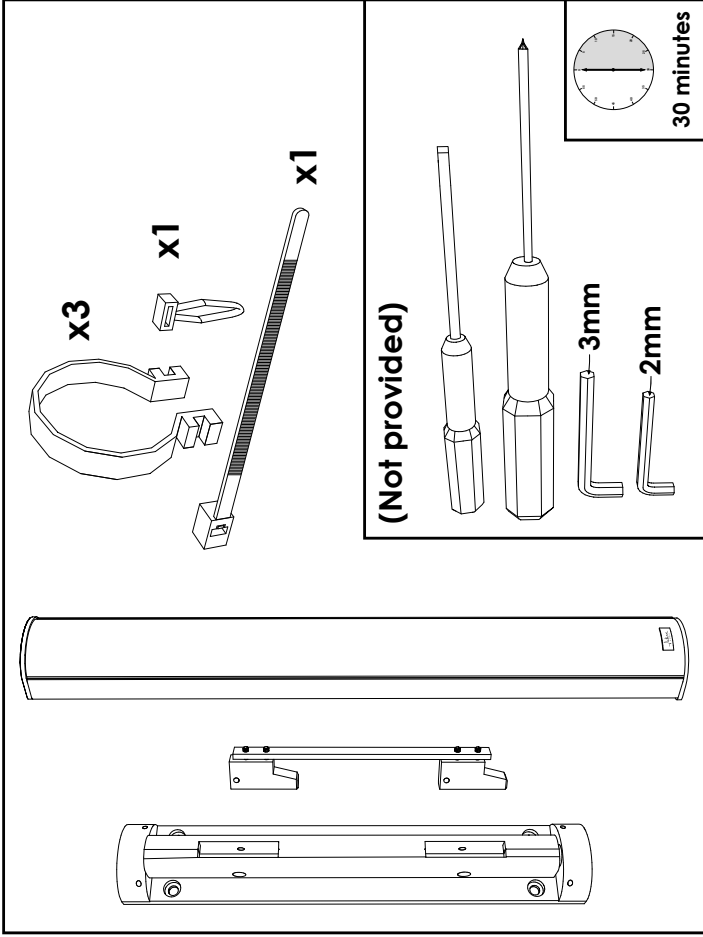
A simple direct sound simulation tool is directly accessible on [www.activeaudio.fr](http://www.activeaudio.fr).

Direct sound prediction is also given in the technical characteristics section [6 on page 9](#).

### 4 Installation and Wiring

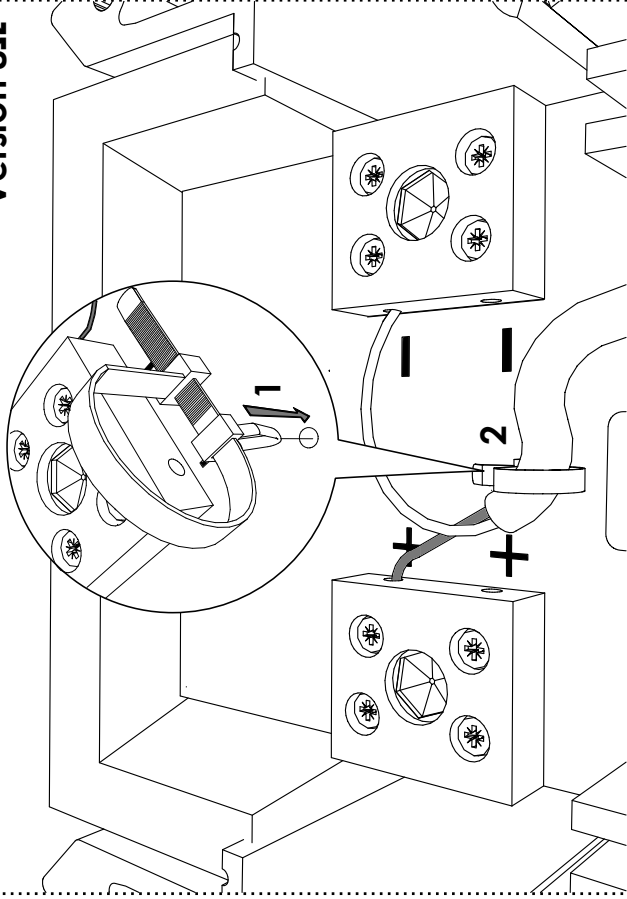
Ray-On 100 is vertically mounted, usually on a wall, using the supplied hanging system. The next two pages illustrate the steps to follow for column mounting.

<sup>2</sup>Ears are at 1.15m from floor for a seated audience, 1.55m for a standing audience.

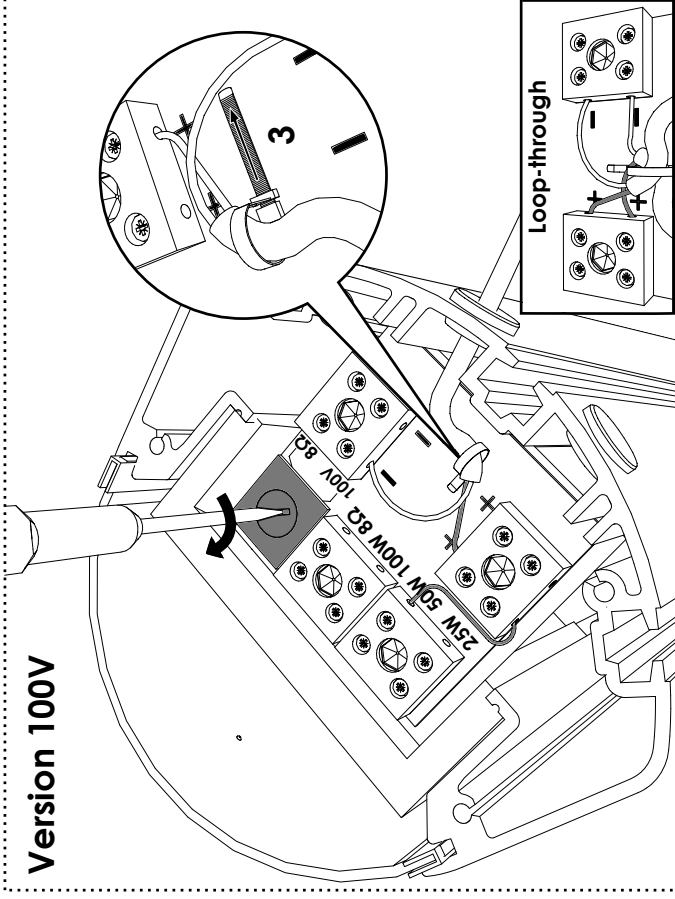


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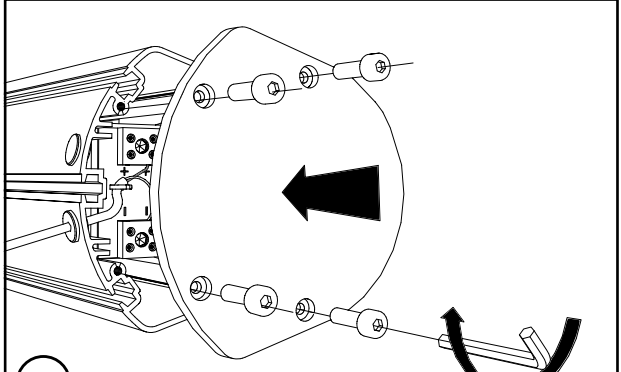
Version 8Ω



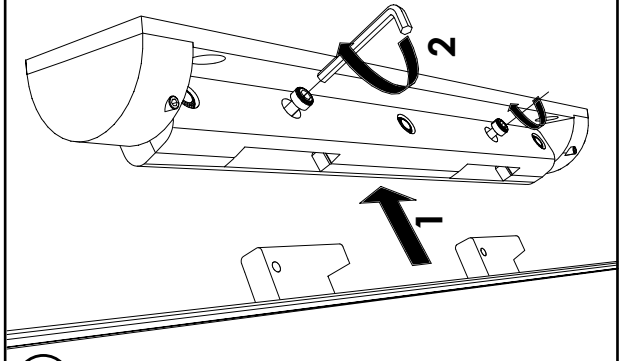
Version 100V



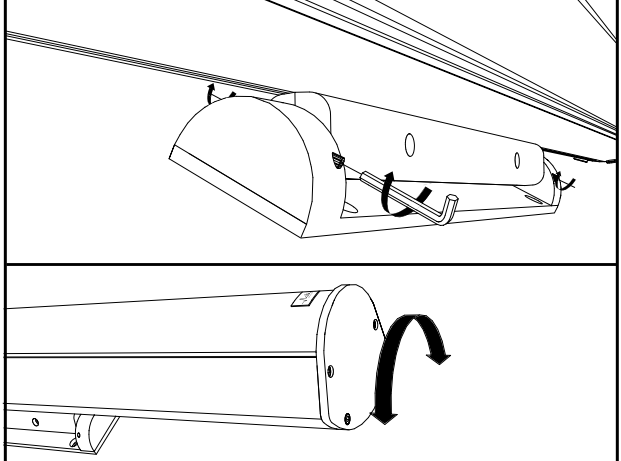
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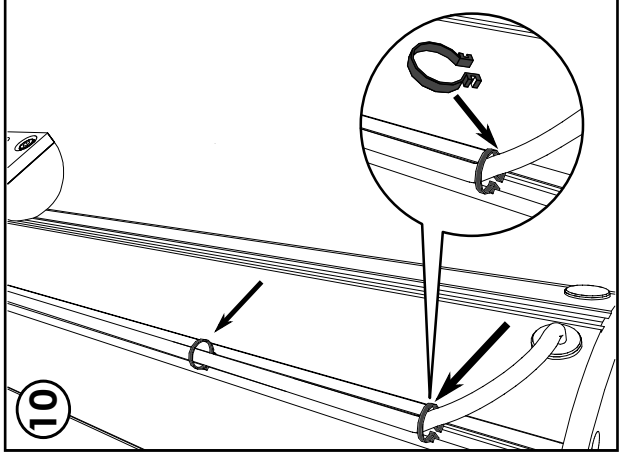
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**Height adjustment:** If changing the column's height is necessary, take the column off its hanging system, move the bracket along the backside rail, then put the column back on its hanging system.

**100V version:** The 100V version can be used as a low impedance speaker. Power selection is made on the connection terminal.

**Safety:** An M5 thread is available at the back of the column designed to accommodate a ring for mounting a safety cable.

«**Daisy-chain**» **cabling:** Two bushings are available on the back of the Ray-On 100 , the second one being used to connect the column to an other Ray-On 100 .



**Good to know:** The cable diameter must be less than 7.5 mm, the wire's between 0.5 and 2.5 mm<sup>2</sup>.

## 5 Equalization and tuning

Ray-On 100 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.

The recommended equalization may be achieved using a 7 bands parametric equalizer<sup>34</sup> as detailed in table 2. The corresponding frequency curve is presented in figure 3.

	Type	Parameters
1	2nd order high-pass	Freq = 130 Hz ; Gain = -3dB (Butterworth)
2	Parametric	Freq = 250 Hz ; Gain = -3 dB ; Width = 1.3 oct (Q=1.1)
3	Parametric	Freq = 6.0 kHz ; Gain = +3.0 dB ; Width = 0.5 oct (Q=2.6)
4	Parametric	Freq = 8.0 kHz ; Gain = +3 dB ; Width = 3.5 oct (Q=0.24)
5	Parametric	Freq = 10.0 kHz ; Gain = +7.0 dB ; Width = 0.5 oct (Q=2.1)
6	Parametric	Freq = 14.0 kHz ; Gain = -10.0 dB ; Width = 0.33 oct (Q=2.3)
7	Parametric	Freq = 1900 Hz ; Gain = -1.5 dB ; Width = 0.33 oct (Q=4.3)
8	Parametric	Freq = 100 Hz ; Gain = +6.0 dB ; Width = 1.5 oct (Q=0.92)

Table 2: Recommended equalization

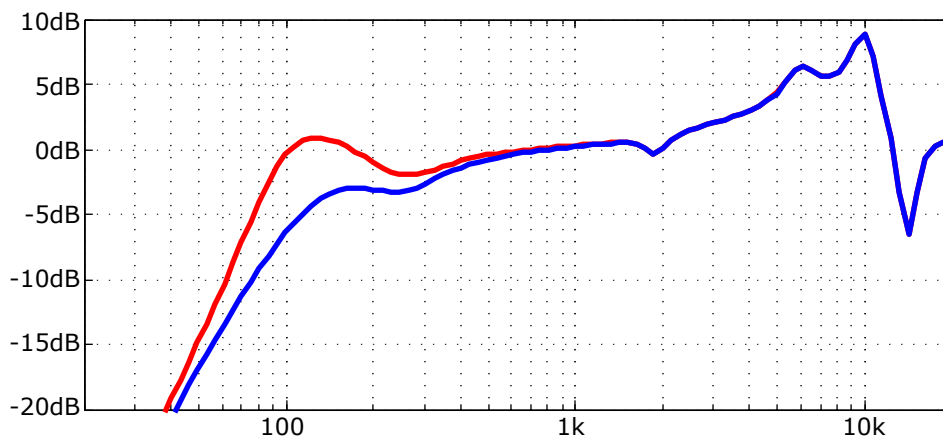


Figure 3: Recommended equalization curve. In red: with cell n°8, in blue without cell n°8.

<sup>3</sup>Cell n°7 may be omitted if necessary.

<sup>4</sup>Cell n°8 may be omitted for speech diffusion.



## 6 Characteristics and Technical Drawings

### 6.1 General Characteristics

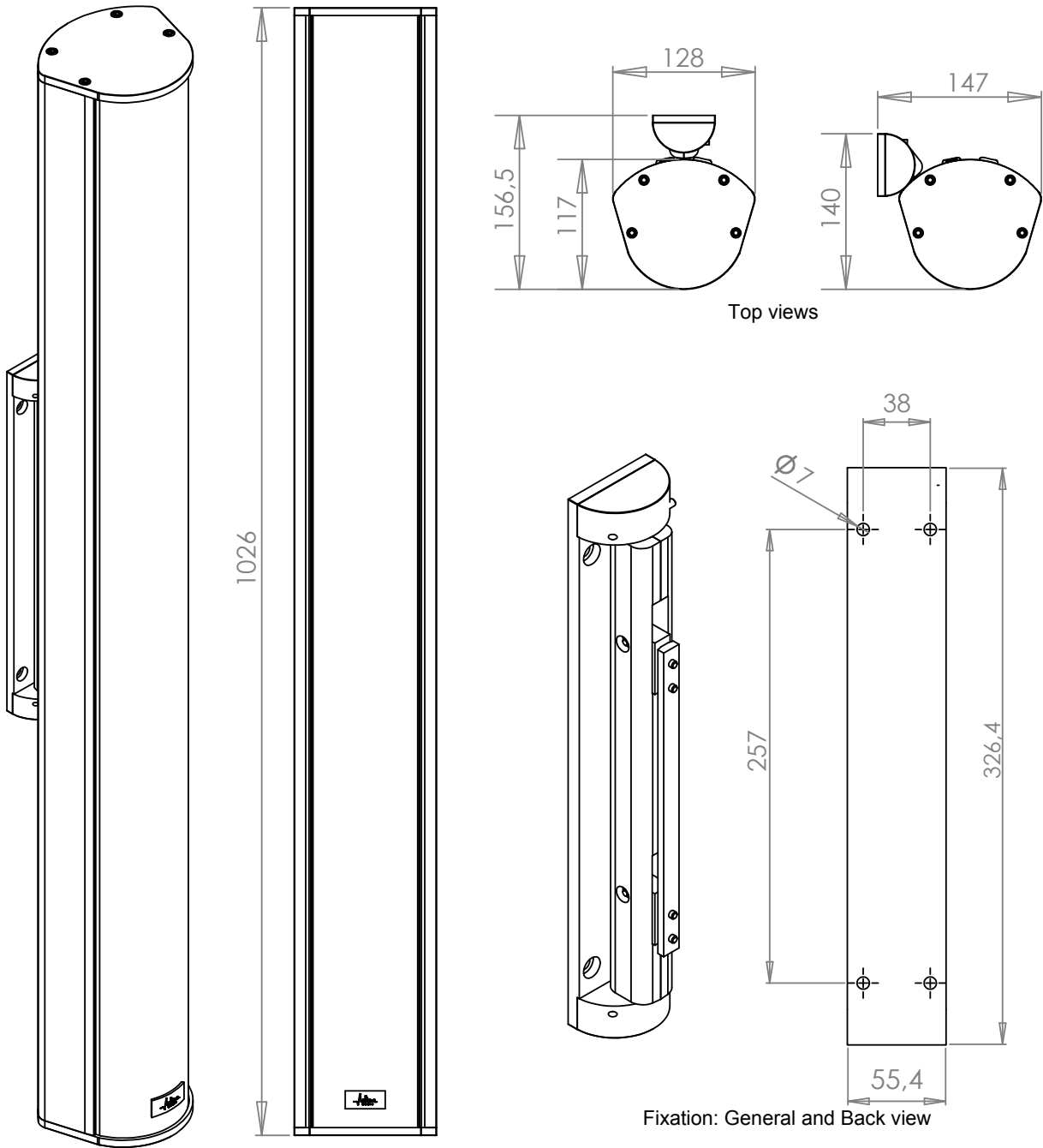
<b>Acoustical data</b>	<b>Low impedance</b>	<b>100V</b>
Sensitivity 1W/8m (equivalent to 1W/1m)	71dB at 1W/8m (89dB/1W/1m)	
Long term power handling (according to EN5424)	150W / (1000W peak)	25 / 50 / 100W
SPL max at 8m	93dB	85 / 88 / 91 dB
SPL max equivalent 1m	111dB	103 / 106 / 109 dB
Frequency response at -3dB / -10dB	150Hz - 16,5kHz / 125Hz - 19kHz	
Vertical directivity	Wavefront synthesis	
Range (500Hz-2kHz $\pm$ 3 dB)	15m	
Range (500Hz-2kHz $\pm$ 5 dB)	22m	
Horizontal opening angle 1kHz / 4kHz	$\pm$ 100° / $\pm$ 70°	
Loudspeakers	12 loudspeakers 70x70mm tropicalized	

<b>Electrical data</b>	<b>Low impedance</b>	<b>100V</b>
Nominal impedance	8 $\Omega$	400 / 200 / 100 $\Omega$
Loudspeaker connector	Ceramic terminal block screw, with "loop-through"	
Wire section	from 0,5 to 2,5mm <sup>2</sup>	
Protection	Thermal fuse and protection against overload	

<b>Mechanical data</b>	<b>Low impedance</b>	<b>100V</b>
Materials	Aluminum steel grid, rust proof and UV proof	
Dimensions H x L x P (mm)	1026 x 128 x 117	
Weight (kg)	9	10
Environment	IP54 — -25°C to +55°C	
Colors	White (RAL9016 repaintable) and Black (RAL9005)	
Mounting	Flush mounting or stand mounting	

<b>Tuning and exploitation</b>	
Recommended equalization	8 parametric cells
Modeling	EASE and CATT-Acoustic models available

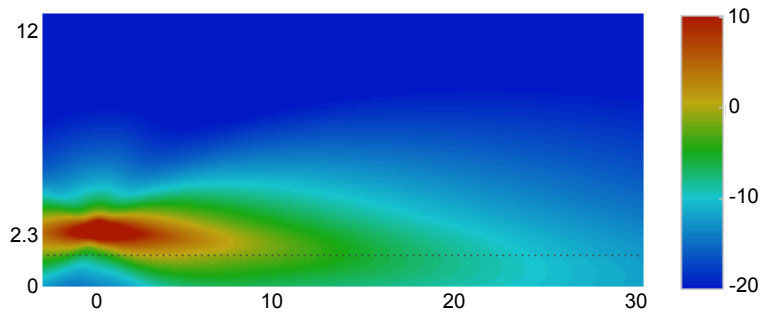
## 7 Technical drawings



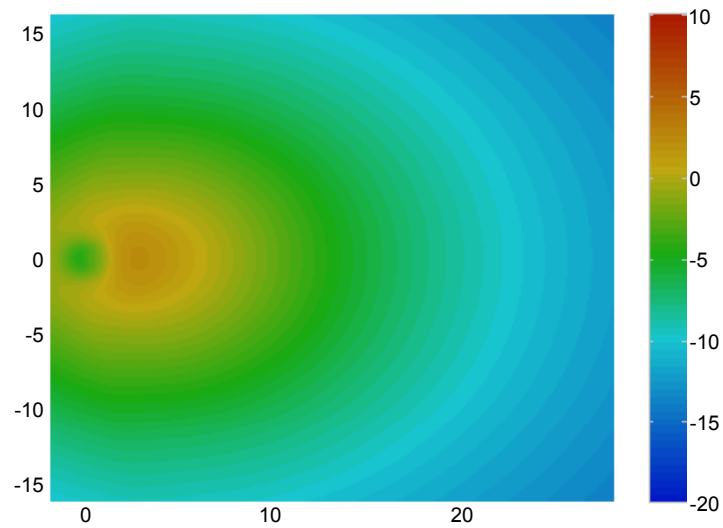
Ray-On 100: General and Front view

Figure 4: Technical drawings

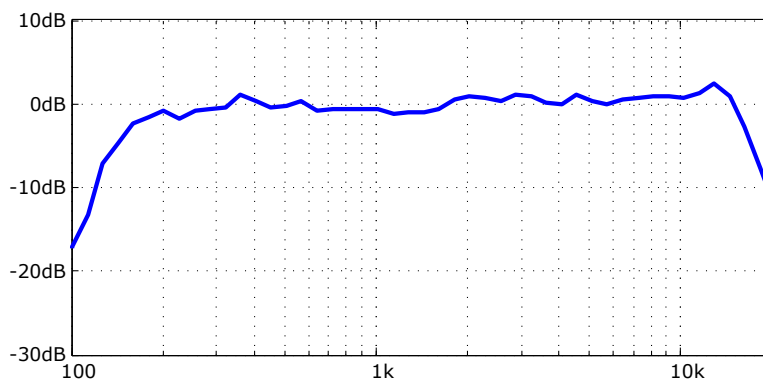
## 7.1 Acoustical data<sup>5</sup>



(a) Vertical directivity: sound level for the voice octaves (500Hz,1kHz,2kHz) in the vertical median plane.



(b) Horizontal directivity: sound level for the voice octaves (500Hz,1kHz,2kHz) on the listening plane.



(c) Frequency response of the Ray-On 100 , with recommended equalization.

Figure 5: Ray-On 100: acoustical data.

<sup>5</sup>Column in nominal position at 2.30m from the floor. The reference SPL is the mean level in the listening zone.

**[www.activeaudio.fr](http://www.activeaudio.fr)**

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