KLANGWERK®

MANUAL

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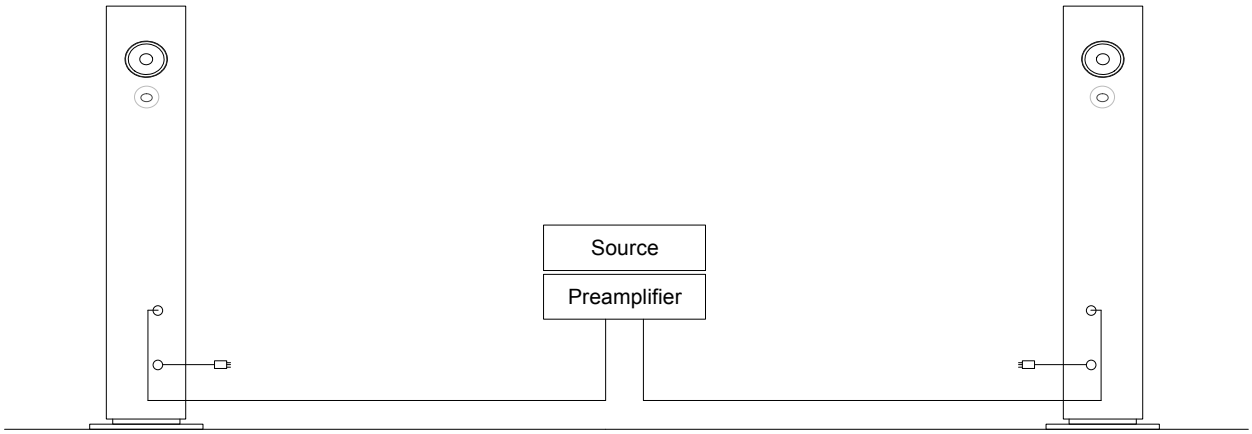
Content

Please read this Manual before unpacking and installing the speakers, especially the chapters **Connections** and **Safety Instructions**.

Speakers should be unpacked, installed and moved always by **2 persons**. Place the speakers with the back (grey side) on a soft surface. Then you can fix the the base plate with the screws which are packed by. First screw all of them loose and then screw them tight. Then turn the speakers in the vertical position by placing them on the **rear edge** of the base plate. When you move the speakers in another position, always place them carefully first on the **rear edge** of the base plate. The other edges could be too weak.

Connections

ELLA is an active loudspeaker-system. The main amplifier is integrated in the loudspeaker and has been adapted for it. Therefore the loudspeakers have connections for mains power and the signal. The signal cable has to be connected to the output of the preamplifier or a source with preamplifier functionality. Please refer to the manual of the device.



Preamplifier / Balanced Technology

For good results, the preamplifier should have balanced outputs (XLR-Plugs). It should also have a sufficient Voltage Output (max. 24V Peak to Peak) to get the maximum sound pressure level.
The balanced technology has several advantages:
The signal cable can be as long as needed for optimum placement of the loudspeakers without losses.
The Conductors (+ and -) are seperated and shielded. Balanced technology means that the + and the - Signal are amplified separately. In the receiving device (the main amplifier) only the difference between the signals is amplified and therefore any disturbances are filtered out. This operation doubles also the amplitude of the signal which doubles the slew rate of the signal. The sound is more dynamic and clear.

If the preamplifier has no balanced output you can use an interface plug or a XLR - RCA signal cable. We can also deliver a special link-box for optimum connection.

Signal Cable / Mains Cable

We recommend using our signal cable or another high quality cable. It has a special construction with 4 conductors which are connected crosswise for an additional protection against disturbances. We deliver the cable to order in any length you require and optional with angled plugs.
We deliver mains cables with 5m length and angled plugs.

On-/Off

When all connections have been made, the devices can be switched on. The LED at the amplifier shoes green light. Please switch on first the preamplifier and then the loudspeakers. The loudspeakers must not be switched off after use because the power consumption is low. It has a standby-mode which can be activated with a 12V-Trigger.
To save energy, all devices should be connected on a switchable power strip. It is preferable to use power strips which are protected against lightning strikes.

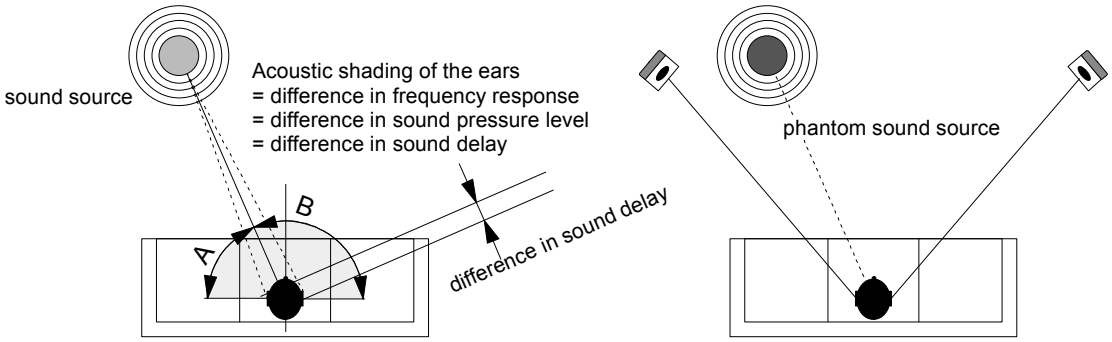
The placement of the speakers is important for a high sound quality at home. The following chapters help you to improve the placement.
We offer also a special service: When you send us a plan (in scale) and photos of your listening room, we will draw our proposals for the loudspeaker placements.

Stability

The loudspeakers must be in a vertical position and placed on a solid, flat ground. They should stand firmly and not rock. If the ground is not flat enough and not horizontal, you should place a firm material under the base plate. We deliver an additional pase plate for uneven floors.

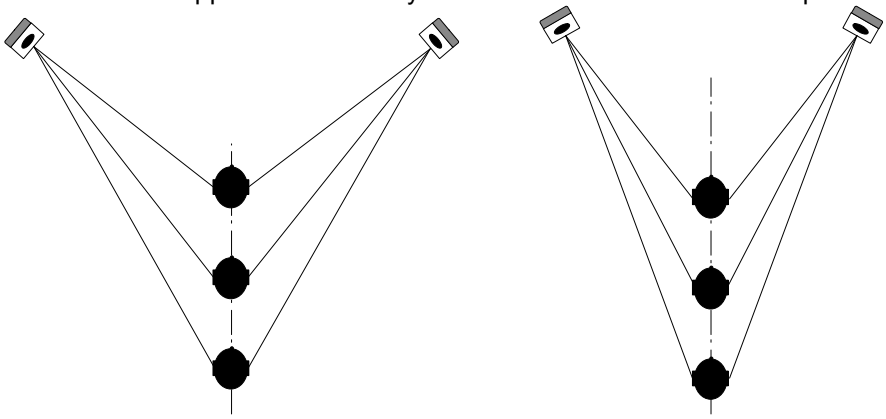
Stereo

This 50-year old standard for reproducing music can establish a three dimensional soundstage and a realistic sense for the spaciousness of the original room. Stereophonic reproductions deceive the ear-brain system to get this impression. The human ear can detect the direction and the distance of a sound source because the sound arrives with a different intensity, delay and frequency response on the left and the right ear. When all of these parameters are simulated with two speakers, the brain gets the impression of hearing a phantom sound source at the direction of the original source.
When the loudspeakers produce irregularities through poor matching of the left and right loudspeakers, bad placement in the room or other problems, the impression of the original space will not be clear.



Balance

The loudspeakers must have an equal distance to the listening position. A Mono signal, for example a speaker on the radio must appear to be exactly in the middle between the loudspeakers.



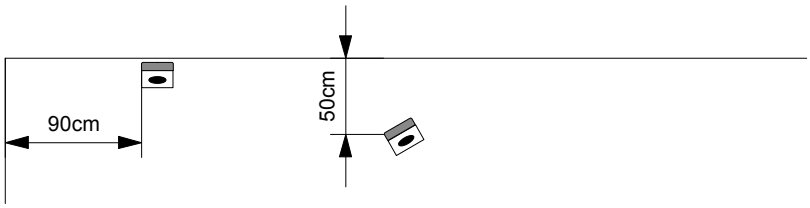
Acoustic Symmetry

The acoustic environment of both loudspeakers should be similar. You can here how different the loudspeakers sound in their environment if you listen again to a Mono signal with only the left and then only the right speaker. You can improve the acoustic environment in many ways to get the best results. You can ask a professional acoustician to get ideas for improvements.

With ELLA you can use the Roll-Off selector to get a closer matching between both loudspeakers in the lower frequency range.

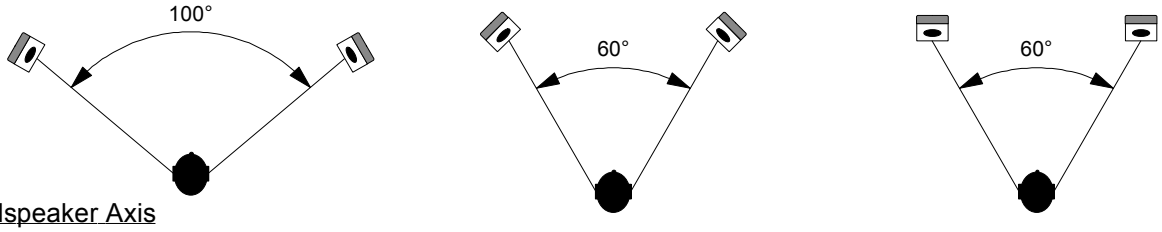
On Wall - Free Space

ELLA can be placed on a wall and also in free space. In both positions the sound is of high quality due to the special form and the Roll Off function in the amplifier. However, best results need typically a distance more than 50cm away from the wall. The distance to the next corner of a room should not be less than 90cm.



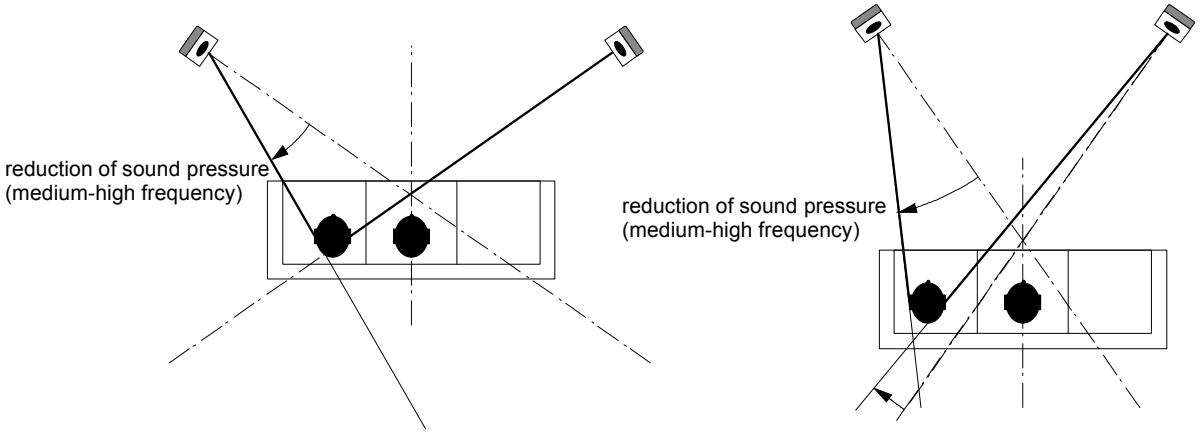
Listening angle

A listening angle of 60° for stereo recordings is common. This is the non-official standard in recording studios. However we recommend to evaluate placing the loudspeakers at wider angles. With wider angles the acoustic shadow of the head is better utilised. The separation between the left and the right channel will be better. The sound will have more plasticity. Angles up to 100° are possible because ELLA has a high linearity in phase. Some recordings may have an unnatural wide sound stage, but in most cases the sound impression will be more realistic and the sound space more sculptural. The disadvantage of wider angles is that the listening zone can be reduced.

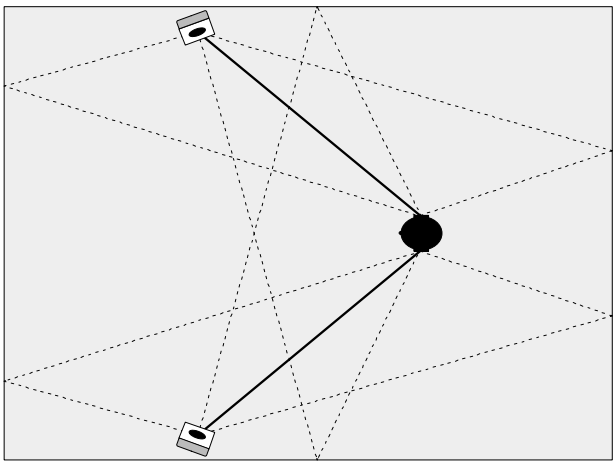


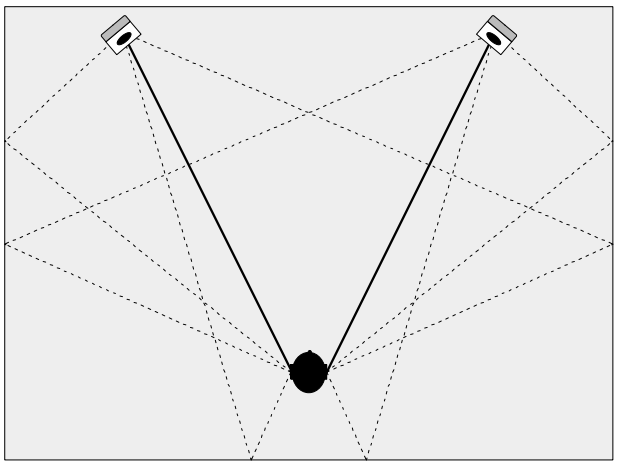
Loudspeaker Axis

The loudspeaker axis should not be orientated directly to the listening position, but should cross in front of it. An angle of 10-20° from the axis is recommended. The loudspeakers have been optimized for this orientation. The soundstage will be deeper and more precise.
Another advantage is the extension of the listening zone, because of an acoustic behaviour of ELLA: The sound pressure off axis will be reduced in the medium and even more in the high frequency range. Listening positions off centre will be nearer to one of the loudspeakers but also more off axis with regards to the nearer loudspeaker. The sound pressure of the left and the right loudspeaker will therefore be equal in a wider zone, which is important for keeping a good stereo effect.
The orientation of the loudspeaker axis can also be used as a high frequency selector: on axis the level is the highest.



Direct Sound - First Reflections



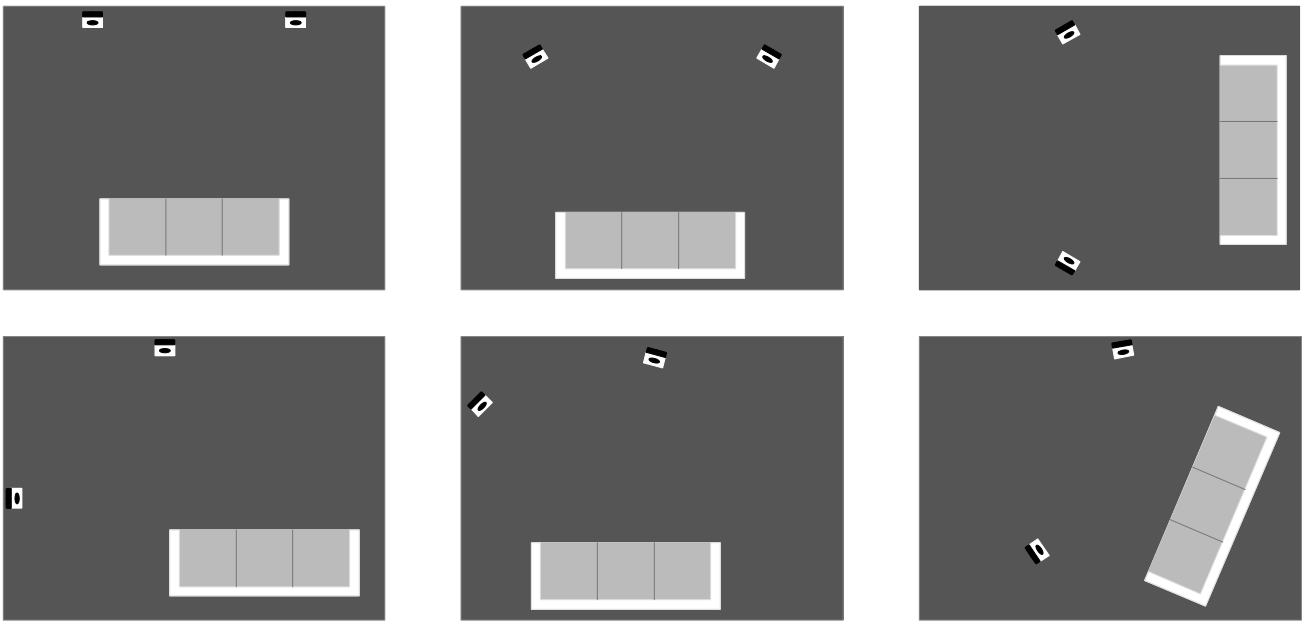


The ear can differenciate between the direct sound and the reflexions when the time delay is sufficient. With a small delay the reflections appear to be added to the direct sound. This ability of the ear is crucial for spacial listening.
The loudspeakers should be positioned in a way to maximise the delay between the direct sound and the first reflections. This means, the difference in distance between the direct and the reflected sound path must be as high as possible. The more reverberant the room acoustic is, the more important this rule becomes. Short reflections can be damped with special acoustic damping material.

The direction of the first reflections has also a certain effect. In the first example some reflections come from the front wall. The sound stage will seem deeper. In the second example more reflections come from the sidewall. The sound stage will seem wider. It is recommended to play with such effects to optimize the subjective sound impression.

Examples

The following schemes show the variety of possible placements for the loudspeakers. Not all positions give the same sound quality. Each room must be considered separately. Our room acoustic services can advice you in special cases and for demanding projects create a complete design.



2- way Active Module

ELLA is powered by an integrated 2-way active amplifier module. Both sections, the treble- and the midrange/low frequency range are driven by their own power amplifier which are optimised for each section. The movement of the membrane is controlled by an adaptive output impedance system (AOI). A phase compensation in the crossover region matches perfectly the treble and the mid-/low frequency range. The treble frequency range can be adapted to match the left and the right loudspeaker.

Overload Protection

The loudspeakers are protected against overload. The regulation is dynamic. When the protection circuit detects an overload, the sound pressure over the whole frequency range will be reduced until the loudspeakers are protected from damage. The frequency response will be even, also when the signal is too loud. When compression starts the LED switches from green to red. As usually the bass section suffers most from overload, the maximum sound pressure level can be raised by turning down the Roll Off control. The electronics itself is also protected from overload. Please always replace the fuse with the same type as marked on the amplifier module.

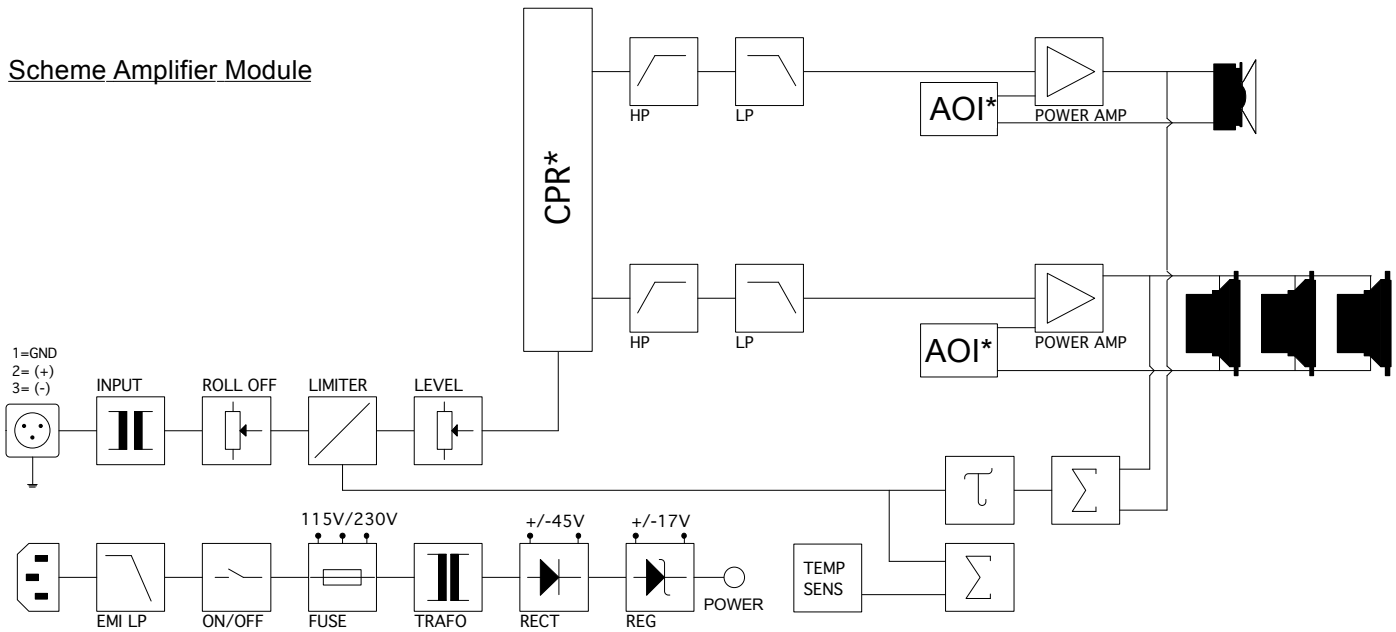
Level

The power output of the amplifier can be reduced with the level-button to adapt it to the level of the preamplifier. Usually the level must not be reduced and remain in the position CAL (calibrated). When the loudspeakers can not be placed in the same distance to the listening position, the level of the nearer loudspeaker can be reduced to get the same sound level for both loudspeakers. A mono signal (for example a news speaker on the radio) must be appear to be exactly between the loudspeakers.

Roll Off

Typically a flat response away from a wall is in massive houses at -2dB and in wooden houses at 0dB (Cal.) If a loudspeaker is positioned near a wall, the level of the low frequency will rise unnaturally. With the Roll-Off button the level can be reduced below 400 Hz to equalize this effect. Usually the level must be lowered between 4 to 6dB to get a smooth response over the whole frequency range. The precise level can be determined by ear, with a Test-CD or a special measuring equipment. The left and the right loudspeaker must be adjusted separately.
The Roll-Off control can also be used to combine ELLA with a Subwoofer. A subwoofer is useful when high sound pressure levels in the low frequency range down to 20Hz are requested. Please use only high-quality Subwoofers with flat low pass filters (-6dB to -12dB/Octave). To get best results, the frequency and phase response of both systems must be measured and adapted by a professional. Usually put the Roll-Off control for ELLA between -6dB to -10dB and adapt the output of the subwoofer.

Scheme Amplifier Module



CPR* = Compensated Phase Response System
AOI* = Adaptive Output Impedance System

CPR / AOI © by Relec SA, Yverdon, Switzerland

Phase linearity

The classical dynamic loudspeaker does not have a linear phase response. The initial signal is slightly delayed and this delay depends on the frequency. The passive filters, commonly used to divide the signal to the different loudspeakers in a box, further the delay the signal in the different frequency ranges. A special problem is the crossover frequency between the loudspeakers. The consequence is that a music signal is no longer time coherent when it arrives to the listener. The loudspeaker is no longer phase linear. As music is a sequence of sudden impulses, all these delays produced by the loudspeakers give instruments and voices an artificial character. This effect can specially be heard with dynamic music: fast piano or violin passages, percussive instruments, orchestral music, Jazz etc.

The active amplifier technology with Adaptive Output Impedance System (AOI) and Compensated Phase Response (CPR) lead to a time coherent or phase linear reproduction about nearly the whole frequency range. Therefore the sound reproduction is accurate and natural.

Soundstage of reproductions

Time coherent loudspeakers can reproduce the soundstage accurately. Stereo and Surround recordings use time delays to deceive the ear that the original soundstage is present. When a loudspeaker has additional delays, the reproduction of space will be smeared.
What has to be considered is that phase distortions can simulate an additional spaciousness, not contained on the recording. With phase linear speakers this pseudo space will be absent and sometimes "missed" and the recording seems "drier".

Impulse behaviour

The usual dynamic loudspeaker works as a mass-spring system: an electrical input will drive the stiff membrane from the zero point in one direction and back in the other direction. The membrane (the mass) tends to oscillate over the predicted point because it is held back by the mechanical (spring) of the loudspeaker. The exact impulse will not be produced immediately. Music is based on continuously changing oscillations why a dynamic loudspeaker has a poor impulse behaviour. An important benefit of the active amplifier with AOI and CPR is the dramatic improvement of the impulse behaviour of the dynamic loudspeakers, because its movement is directly controlled by the amplifier. With passive systems this control is nearly absent.
What you will hear is that the sound is very precise and natural and you can listen to the music for hours without fatigue.

Level

In most appartments it is not possible to listen to the music at high volumes. Small rooms tend to compress the sound to an unnatural effect. To get a realistic effect and for everyday-use it is important that a loudspeaker sounds convincing at moderate levels. You will realize when listening with ELLA, that high sound pressure levels are not important to get the full range of details in the music. This is another benefit of the active technology.

C.E. - and RoHS - Conformity

All of the used components within this device fulfill the actual European (EU-) standards for safety and handling according to the following EU directives and amendments:

Low voltage directive (LVD), 2006/95/EC Electromagnetic compatibility directive (EMC), 2004/108/EC

The relevant technical standards are:

EN 60065: 1998 Audio, video and similar apparatus – Safety requirements (Class 1)
EN 55103-1/E1: 1996 Product Standard – Emission / Audio, Video and audio-visual apparatus for professional use
EN 55103-2/E1: 1996 Product Standard – Immunity / Audio, Video and audio-visual apparatus for professional use

This product is manufactured according to the European directive 2002/95/EC (RoHS - compliant)

Safety instructions / Handling

Please place the loudspeakers on a rigid horizontal ground. Install the speakers that they are stably positioned.

A special steel plate with micro-spikes can be ordered for best results.

Do not expose the loudspeakers to strong sunlight. Don't place the speakers nearer than 40cm in front of a window. The room climate should be dry.

Shipping the loudspeakers: please use our wooden palett boxes for safety reasons.
When transporting the loudspeakers with a car, put them in our packing material. Always move the loudspeakers with two people. When you place them on the floor, please put them carefully on the back edge of the base plate and set them upright afterwards. Never put them on the corners of the base plate as the corners can be damaged.

Don't touch the membranes. The membranes of the speakers are very sensitive and can easily be damaged.

The amplifier must be free to get sufficient air for cooling. A minimum distance from 3cm to a wall is enough. Prevent any liquid getting inside the amplifier module. When cleaning the box always unplug the mains cable first.

The device can only be opened by a specialized person. If the loudspeaker seems to be damaged unplug it from the mains and call your local specialist.

The fuses can be changed from outside. Always unplug the loudspeaker from the mains when you change the fuses. Use the same type of fuse when exchanging the fuses.

When a thunderstorm is announced, the loudspeakers should be unplugged from the mains to prevent a shock through lightning. A special mains power strip can reduce the risk of damage.

Technical data

Full Active 2-Way Loudspeakersystem

Tweeter:	25mmØ / Magnesium-Membrane, Waveguide with Acoustic Lens
Woofer-Midrange:	3x 145mmØ / HDA-Membrane (High-Definition-Aerogel)
Active Electronics featuring:	- Analog Crossover and Amplification (Class G) - Adaptive Output Impedance System (AOI)* - Compensated Phase Response (CPR)*
Sensitivity for 100dB SPL @1m:	775mV (adjustable)
Input Impedance:	balanced, 10kOhms
Input Overload:	24Vpp
Signal to Noise Ratio:	-96dBA
Power RMS:	40+120W
Continuous Max. SPL@1m:	106dB
Frequency Response (-6dB):	36Hz-22’000Hz
Crossover Frequency:	1600Hz
Roll Off below 400Hz:	0dB - 3dB/Octave
Signal Input:	XLR F/3P
Voltage:	115/230V (50-60Hz)
Power Consumption:	7-70VA
Box Material:	MDF Nextel lacquered
Baffle / Base Plate Material:	Artificial Stone: CREANIT® / CORIAN®
Net Weight:	20.5kg
Dimensions: HxWxD / WxD (Base Plate)	1129 x 216 x 189mm / 380 x 288mm

* AOI and CPR © by Relec SA, Yverdon, Switzerland

Technical adaptions are subject to change without notice

Before cleaning, the speakers must be unplugged from the mains supply.

The cabinet can be cleaned with a dry soft towel. Strong dirt can be removed with special alcohol for cleaning. The white Creanit-surface can also be cleaned with window cleaner.

Strong dirt on the Nextel lacquered grey surface can also be cleaned with an eraser.

Scratches in the white and black Creanit surface can be refurbished in our facilities.

Be VERY CAREFUL about the TWEETER MEMBRANE. Especially instruct children NOT to touch it. The acoustic lens is soft and gives not complete protection to damage of the membrane.

Warranty

The warranty is lasting 2 years. It starts on the date of purchase of the loudspeaker. The invoice is the warranty-card and must be stored.

During the warranty-period all defects which can proved to be due to manufacturing defects will be covered. This will be done through replacement or an improvement of delivered parts and has to be done through elements of our choice and through approved persons. It can not be done through other third persons. Other pretensions, especially compensations for following damages are excluded.

No other manipulations than described in the manual are tolerated.

In case of a warranty cause, please refer with the invoice to the local dealer or directly to us. If the loudspeaker must be sent to us, proceed as follows: Write a description of the defect. Order a shipping box and material and send the product to us. The transport costs and the risk must be covered by the purchaser.

Not covered by the warranty are:

- Damages from transport (visible or unvisible) Please refer to the transportation company.
- Scratches on the cabinet. These must be declared and documented 5 days after purchasing.
- Defects which are consequence of incorrect or non careful handling, violence, force majeure.
- Devices which have been repaired or changed through other than our approved persons and without our authorisation.
- Following damages on other devices
- Compensations in money when repaired through third persons without our authorisation
- Devices where the serial number has been changed or is no more visible.
- Changes in behaviour through natural aging or using of the device

Serial Number:	Controlling Person:	Date:

Modification:	Responsible Person:	Date:

Level (dB) L/R:	Speaker/ Position	Date

Roll Off (dB) L/R	Listening Room/ Position:	Date

Remarks: