RLX-15

Datasheet & Manual
Engineering information

Description

Metro Audio Systems **RLX-15** is a passive full range two-way loudspeaker system aimed to fulfill the most demanding needs in speech and music reinforcement applications.

RLX-15 unit is suitable for stage monitoring-touring class, near field FOH, and almost every other possible use and installation. It can be hanged on truss via eyebolts or U-type brackets (vertically or horizontal), can be combined in clusters, monitor angle 45º.

The cabinet is reinforced with CAD-optimized wooden bracings and metal bars to ensure long-term durability. The rear panel connector plate houses two Neutrik Speakon NL4MP connectors for loop in and out connections to additional cabinets.

RLX-15 consists of a front-loaded neodymium 15-inch, 4-inch voice coil LF driver and a 1.4-inch exit, 2.83-inch voice coil HF neodymium compression driver on a 80H x 50V waveguide/horn. Its passive crossover circuit has been realized with premium-quality components; SCR MKP capacitors and oxygen-free copper air-coils.

RLX-15 is designed to work with the OnStage DSP 230 and DSP 240 digital loudspeaker controllers, and can be accompanied with the RLX-18 18-inch subwoofer, with which it offers even more flexibility and optimum sonic performance.

OnStage PFL and SX series Amplifiers are perfect partners for the RLX-15 unit.

Exceptional Sensitivity and Power handling

Smooth Impedance curve with high absolute magnitude

Wide dispersion and very smooth frequency response

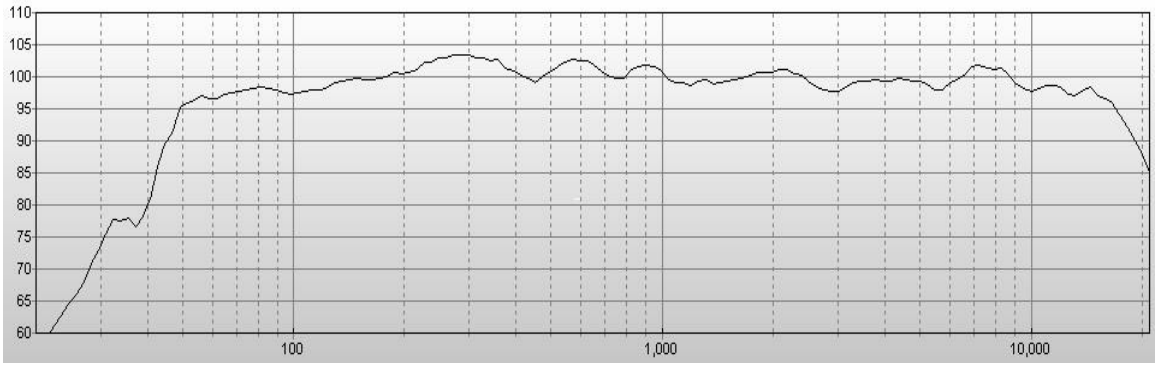
Rigid and lightweight box construction

Specifications

Frequency Range (-10 dB)	45Hz – 20 KHz
Frequency Response (+-3 dB)	50Hz – 20 KHz
Horizontal Coverage (-6dB)	80º
Vertical Coverage (-6dB)	50º
Power Handling	1 KW AES 2 KW program
LF Freq. resp. limit by max linear excursion @ max. input power	42 Hz @ 1KW
Bandpass Sensitivity / Nominal Impedance	100dB SPL/m/W 8 Ohm
Max SPL (calculated) – 1m	130dB continuous, 136dB peak
Minimum Impedance value	7.5 Ohm @ 200 Hz
Impedance Phase	+- 30º @ 150 Hz – 12 KHz
Box Construction	15mm Baltic Birch
Support	M6 internal rigging points for wall bracket M10 internal rigging points for U horizontal and vertical brackets, with fixed angles adjustment 38 mm pole socket (top hat) for wall base or floor stand (tripod) Capability to mount in clusters
Dimensions (W x H x D)	455 mm x 750 mm x 405 mm (17.91” x 29.53” x 15.94”)
Weight	26 Kg (57.3lbs)

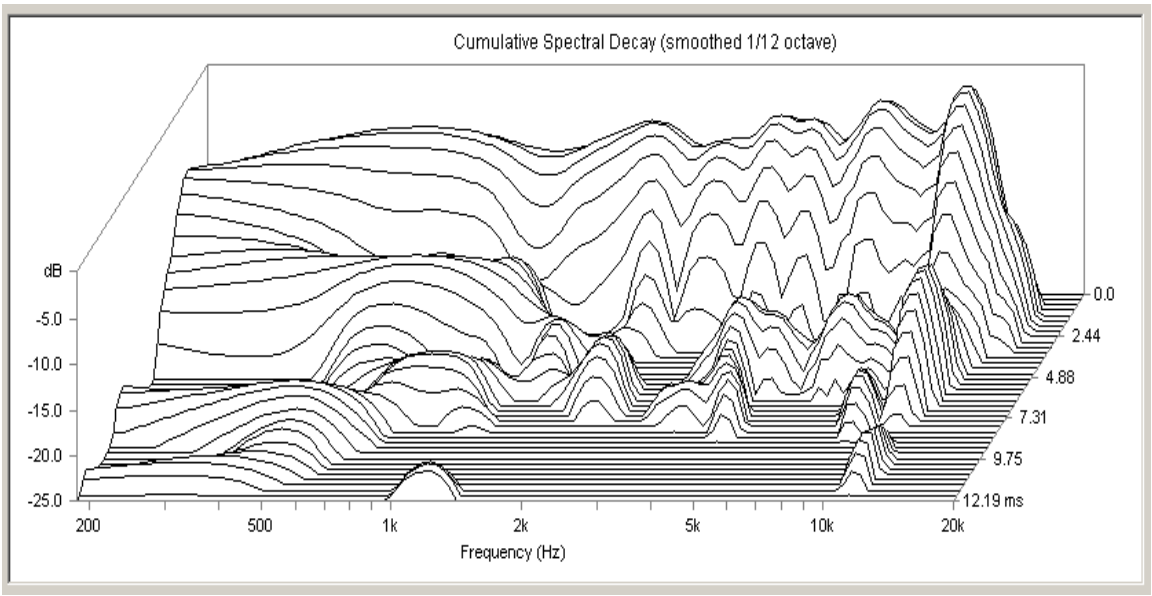
Electrical Measurements

Frequency Response
dB SPL / 2.83V / m



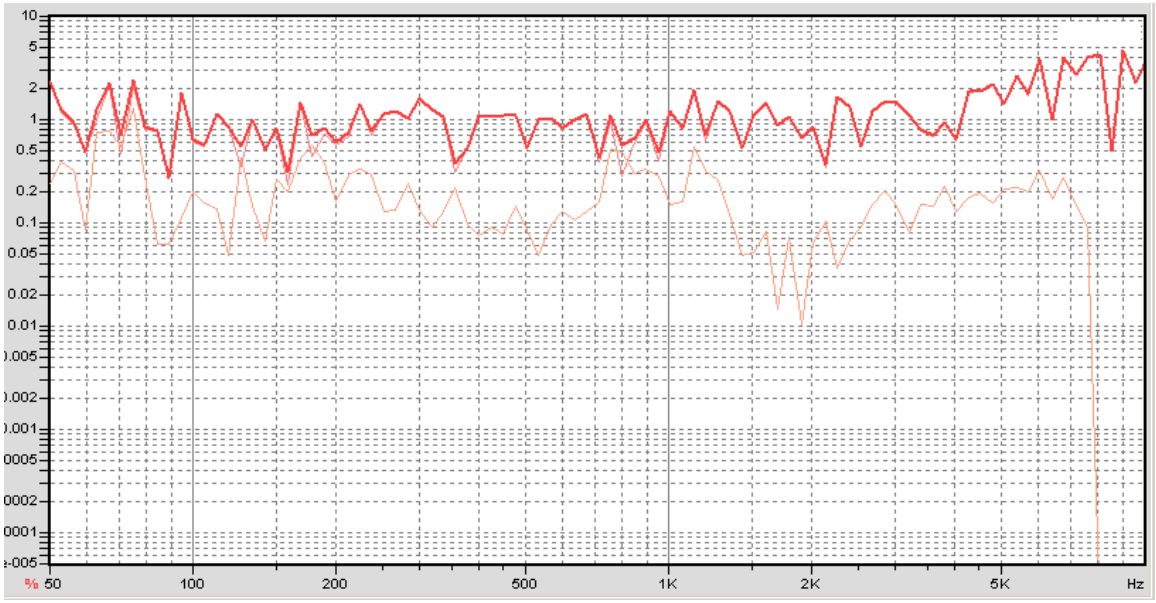
Half-space measurement @ 2m on axis, normalized to 2.83V/1m, 1/6 octave smoothed

CSD



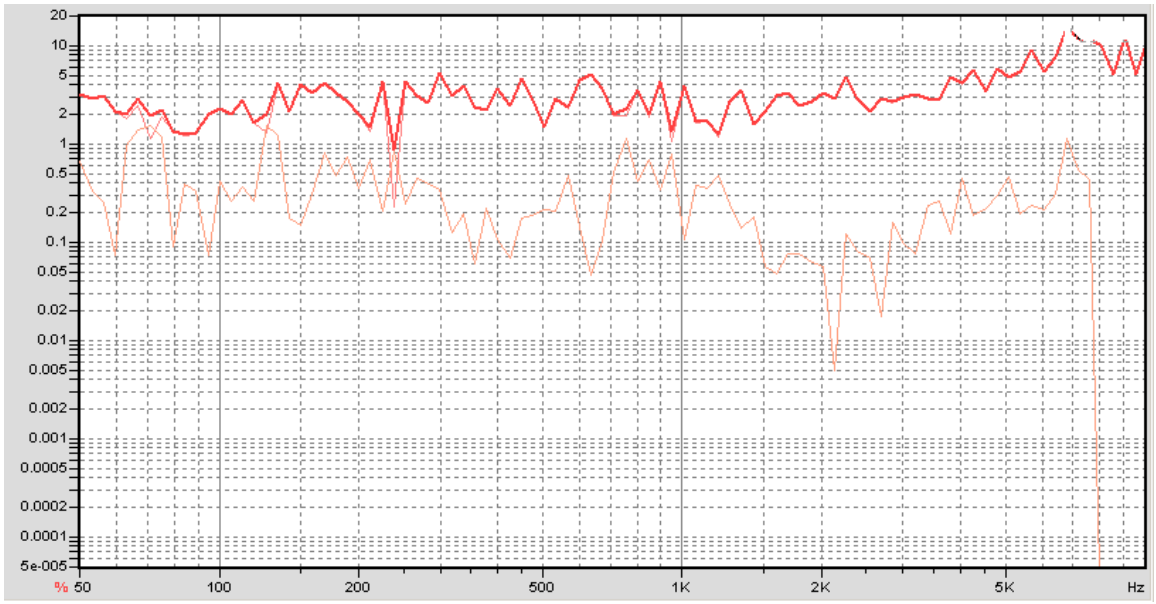
1/12 octave smoothed

THD
Total, second, and third harmonic distortion @ 1W input power



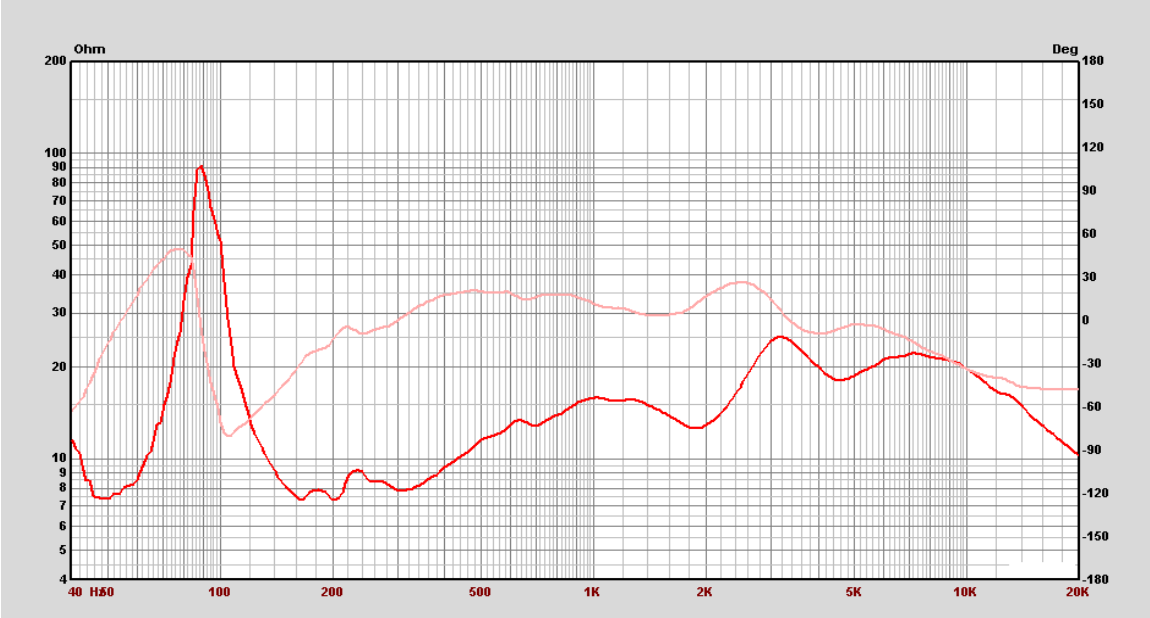
Unsmoothed response

Total, second, and third harmonic distortion @ 115 dB / m



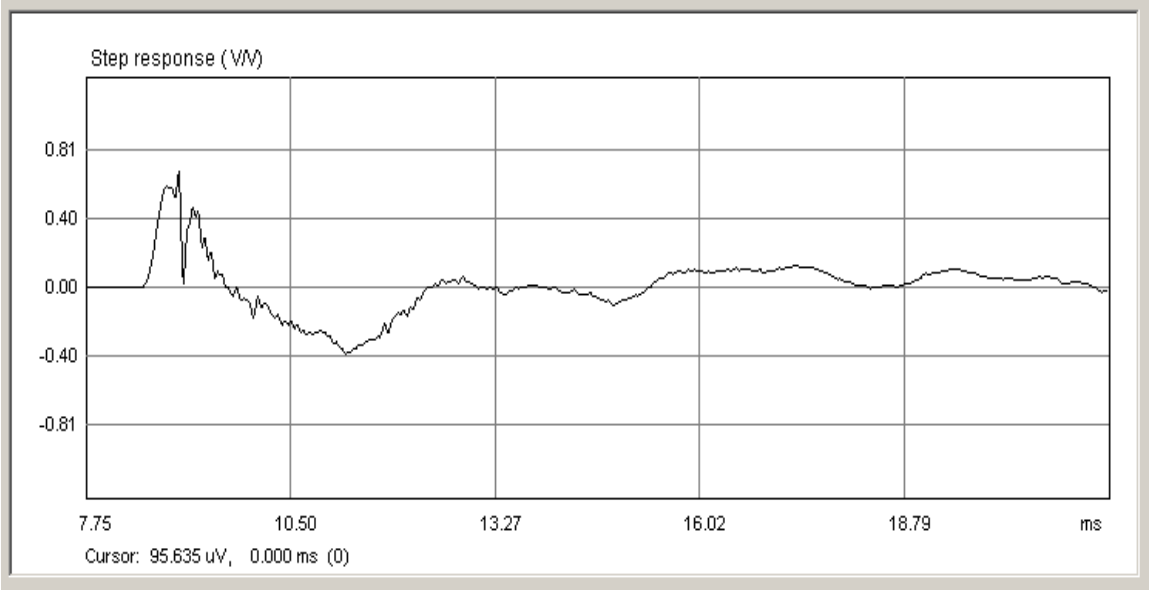
Unsmoothed response

Impedance magnitude & phase response

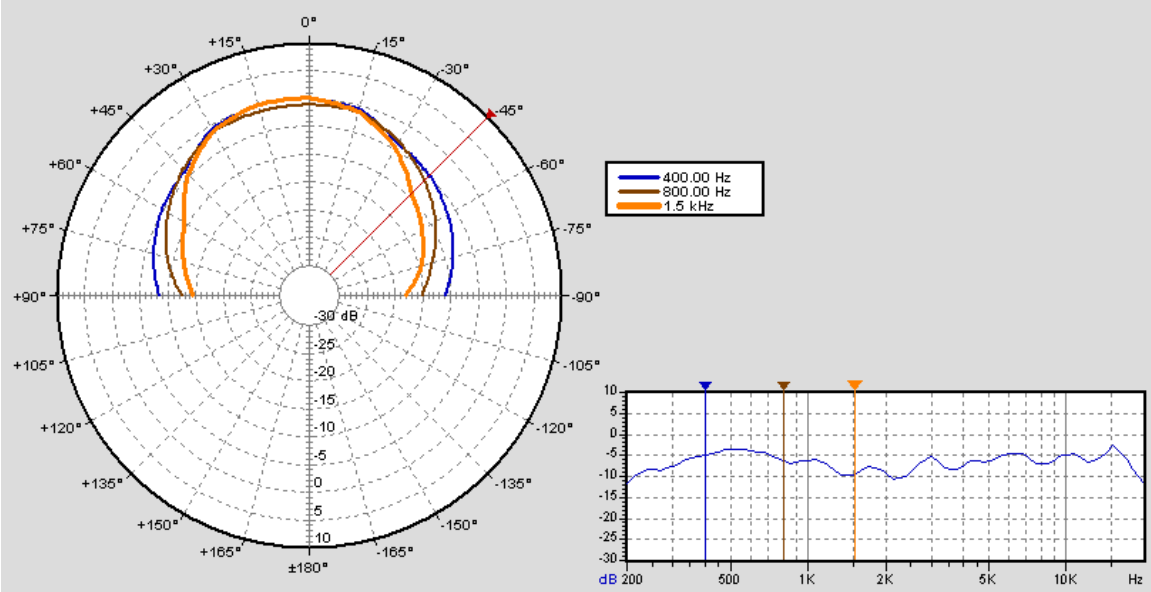


Unsmoothed response

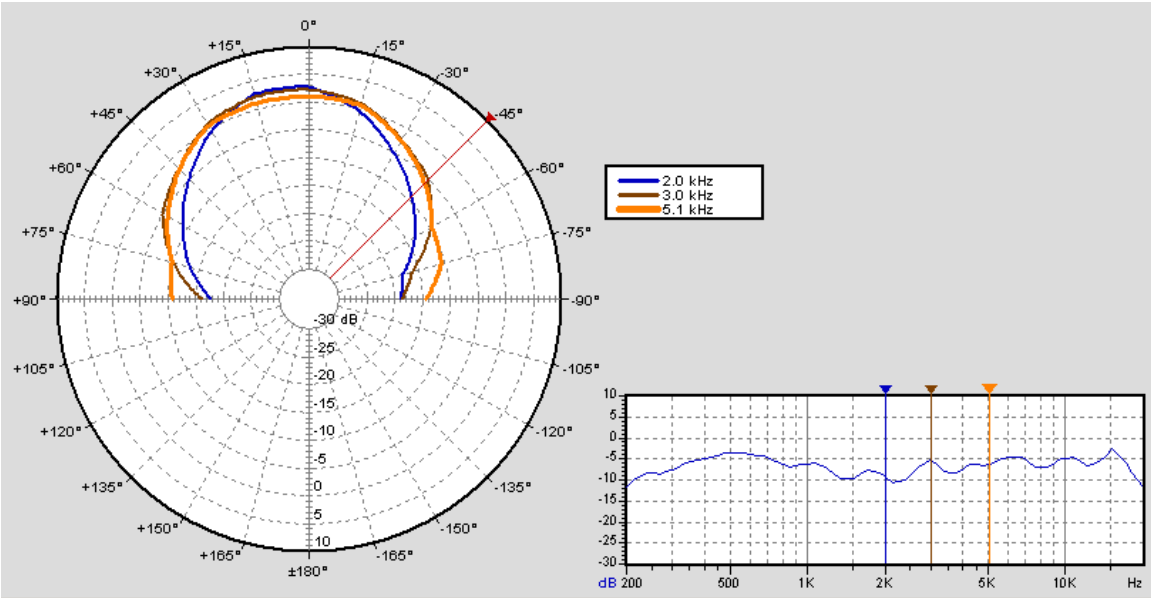
Step response



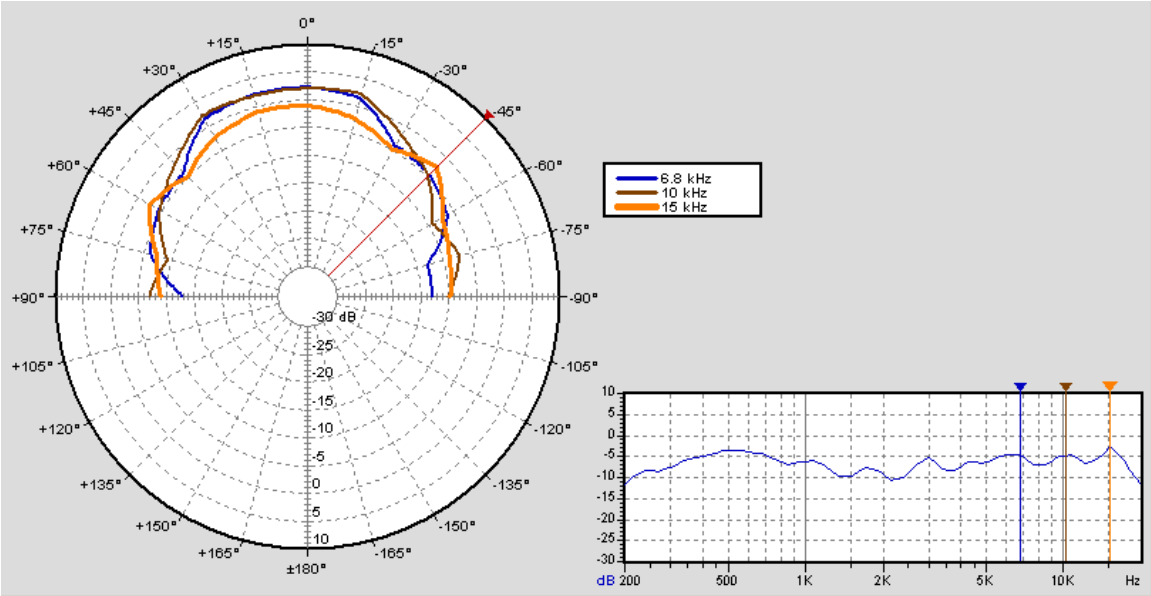
Horizontal Dispersion
400 Hz - 800 Hz - 1.5 KHz / 45º Freq. response



2 KHz - 3 KHz - 5.1 KHz

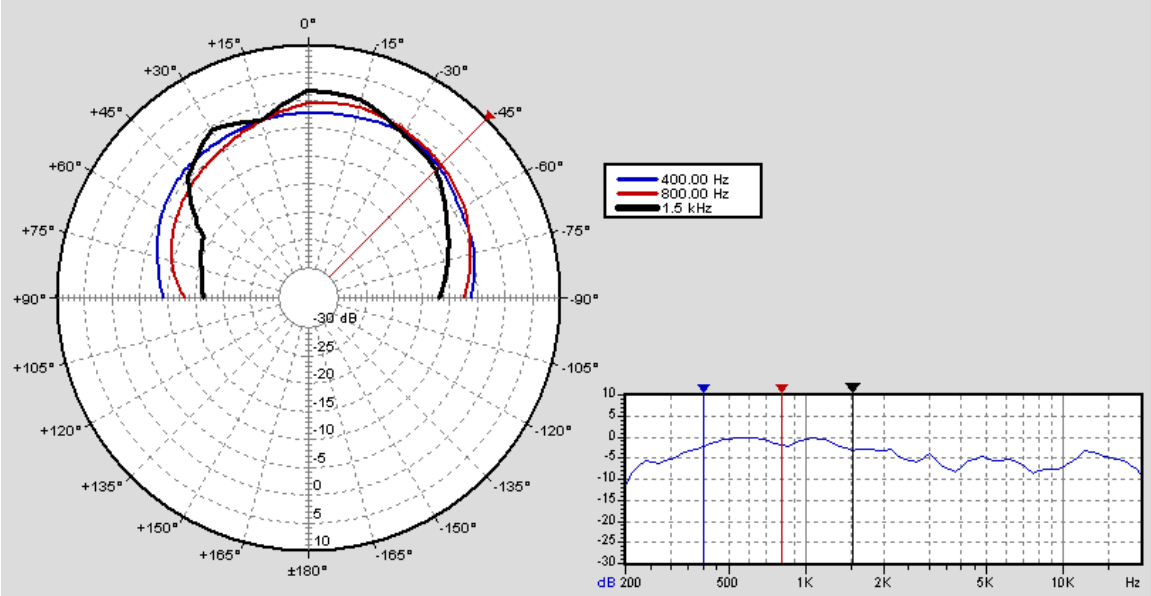


6.8 KHz - 10 KHz - 15 KHz

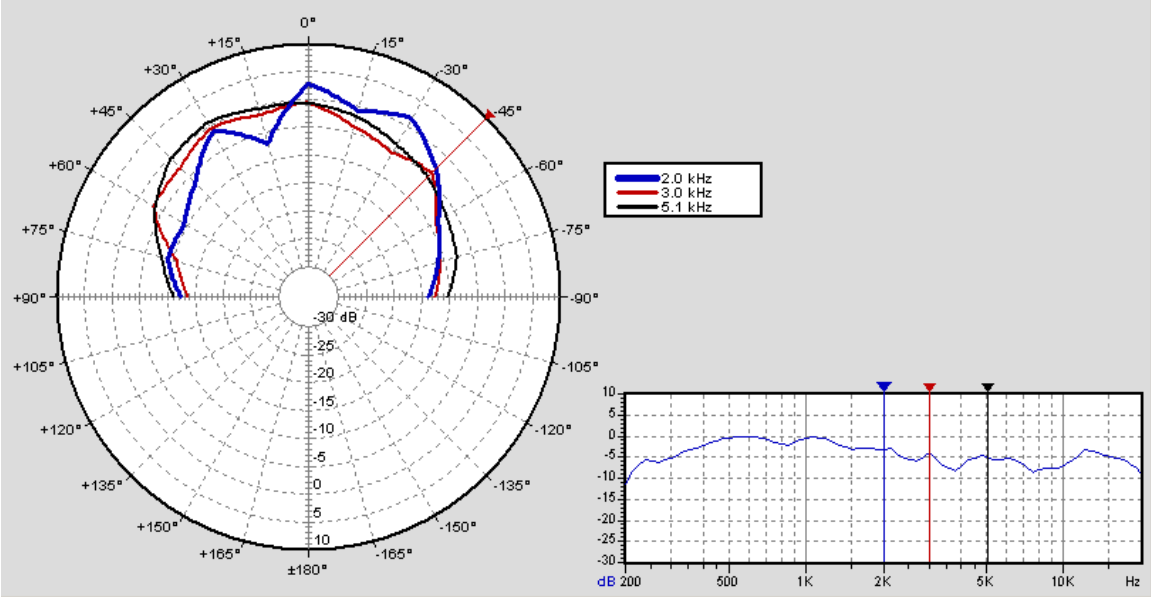


Semi-Anechoic measurement
SPL reduction past the -15dB barriers shouldn't be considered as perfectly accurate

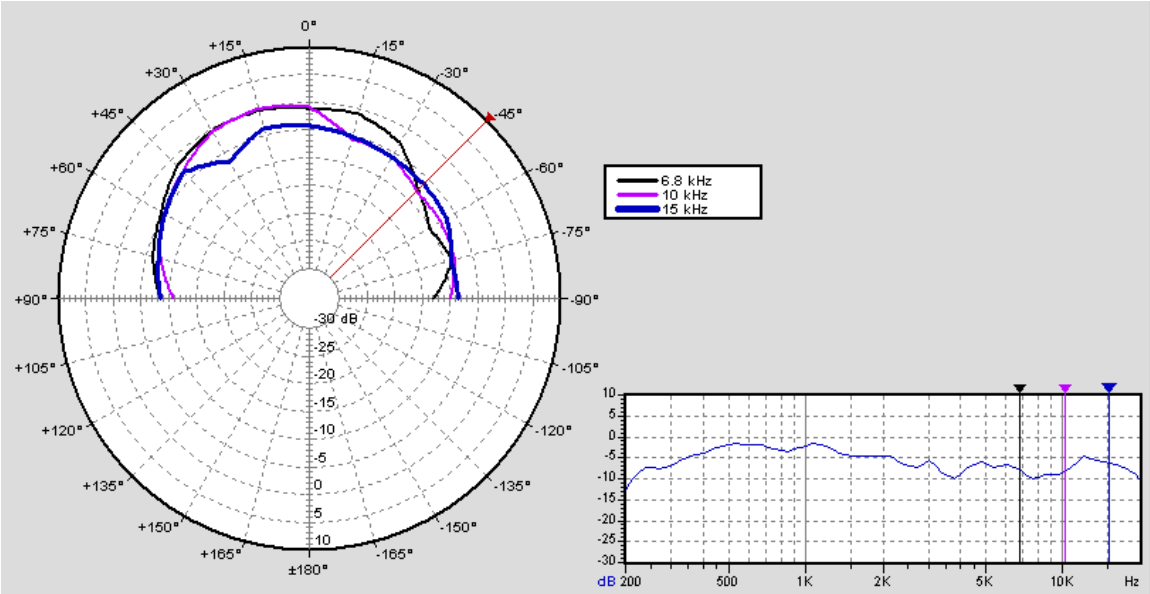
Vertical Dispersion
400 Hz - 800 Hz - 1.5 KHz / 45º Freq. response



2 KHz - 3 KHz - 5.1 KHz



6.8 KHz - 10 KHz - 15 KHz



Semi-Anechoic measurement
SPL reduction past the -15dB marks shouldn't be considered as perfectly accurate

Off-axis response and Loudspeaker aiming Considerations

RLX-15 crossover circuit has been specially optimized to purposely present a better frequency response at and below the loudspeaker axis, than above.
If the Loudspeaker is to be installed with the best possible coverage and frequency response in mind, it should be hanged up and aimed towards the depth of the auditorium to exploit this fact (i.e. the whole audience will be positioned at and bellow the loudspeaker axis), and accomplish a smooth and even coverage in the majority of the auditorium space.

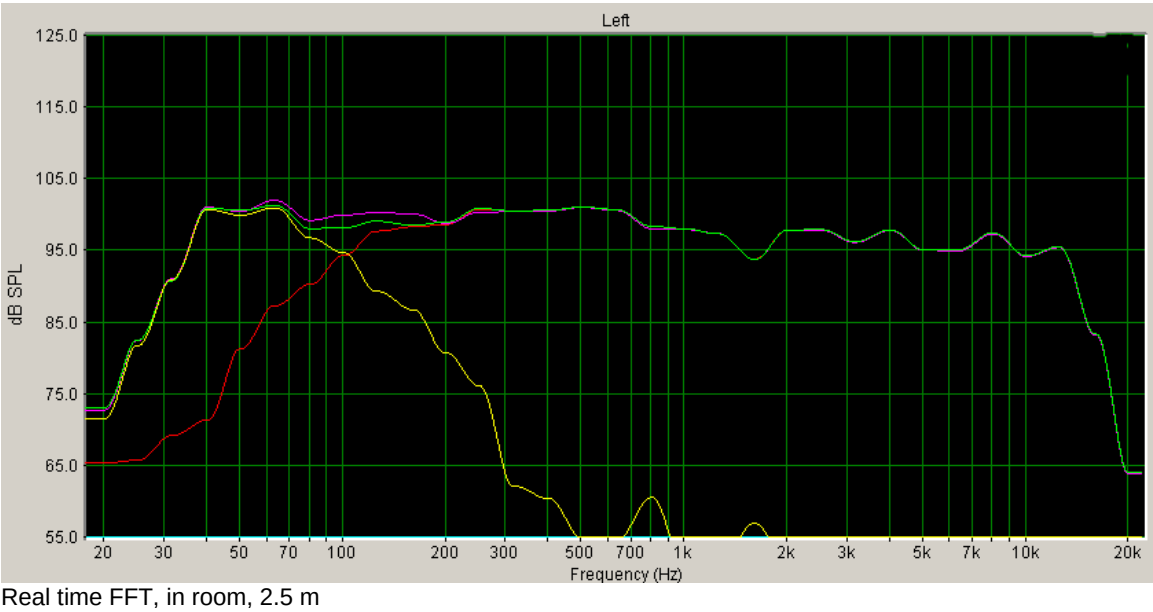
RLX-15 & RLX-18 Subwoofer unit

Recommended active crossover points and slopes

Depending on usage, the ideal frequency to crossover RLX-15 with the RLX-18 subwoofer unit lies in the 80 to 100 Hz region. Crossover slopes could be chosen as low as 12 dB / octave, since RLX-15 is capable of withstanding great input power at frequencies as low as 42 Hz without exhibiting a significant rise in distortion products.
Text-book crossover types and typical phasing work well with the RLX-15 and any typical 15 or 18-inch subwoofer of good quality.
For general purposes, we recommend a Butterworth 4th order (24 dB / octave) @ 90 Hz crossover, but even a Butterworth 2nd order (12 dB / octave) @ 90 Hz with inverted phase to the RLX-15 unit will work very well if RLX-15 and RLX-18 units are in reasonable proximity.
If a Butterworth 3rd order crossover is to be chosen, frequency responses don't sum up perfectly in the crossover region, and a +45^{o} phase shift in the RIX-18 unit should be settled.
If an L-R type crossover is to be chosen, we recommend a slight overlap in the subwoofer and RLX-12 center frequencies.

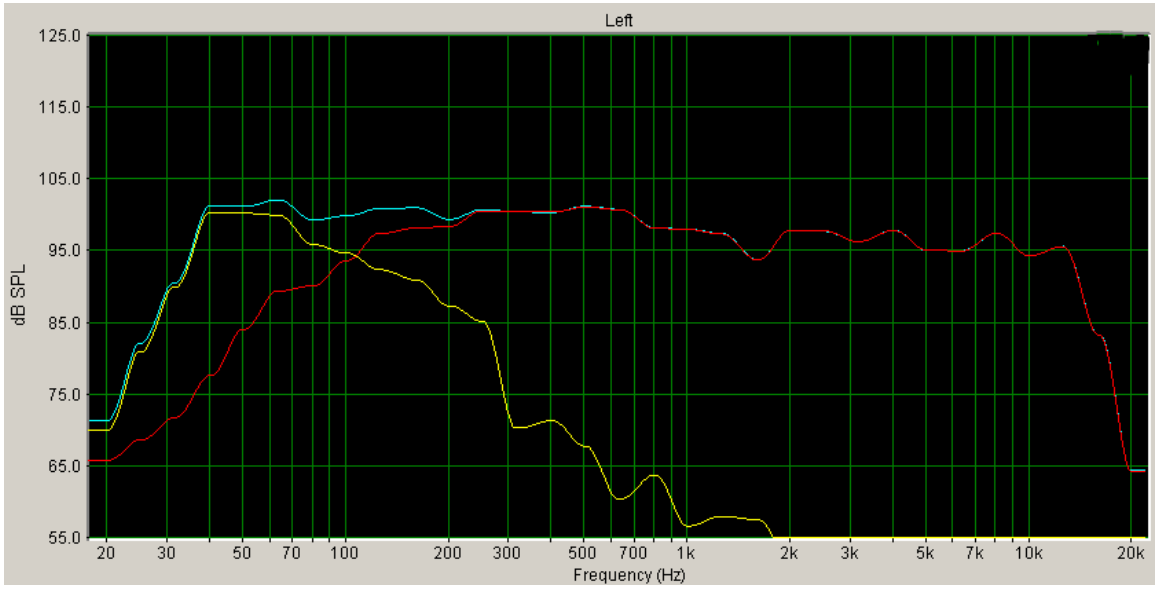
In the following diagrams, four typical crossovers for the RLX-15 and RLX-18 subwoofer unit are shown.
All responses are measured in real use circumstances, in-room (ca 150 m^2, moderate to low reverberation time), with no other equalization filter adapted.
RLX-15 was placed on top of the RLX-18 cabinet, and the measurement microphone was 2.5 m away, on RLX-15 axis.

Butterworth 18 dB / octave @ 90 Hz / in phase and with +45^{o} on subwoofer



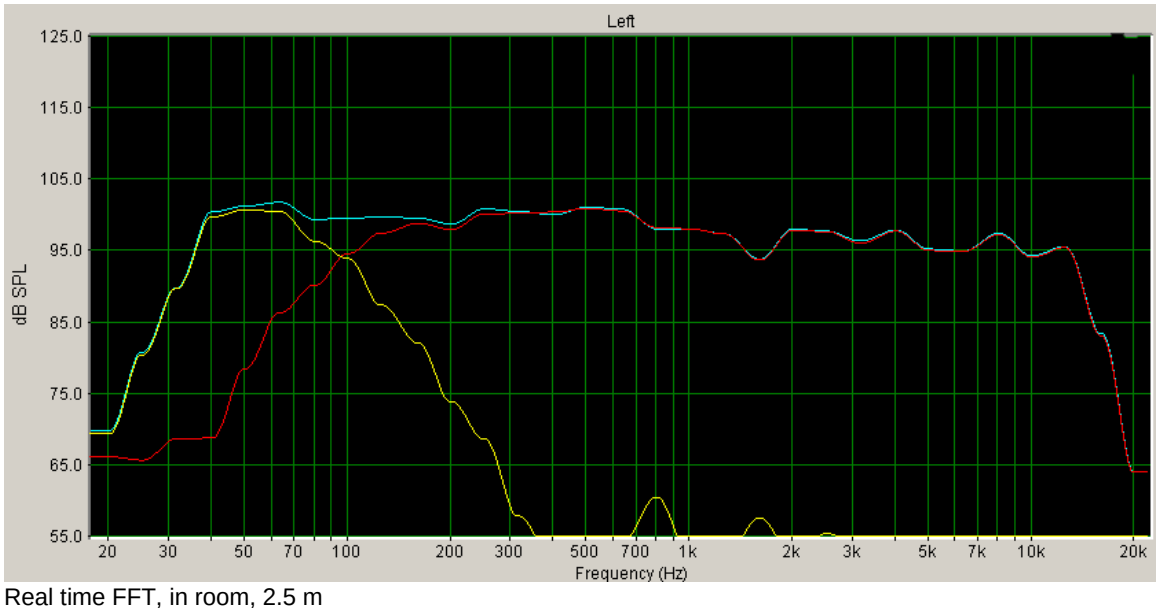
Real time FFT, in room, 2.5 m

Butterworth 12 dB / octave @ 90 Hz / RLX-12 with inverted phase



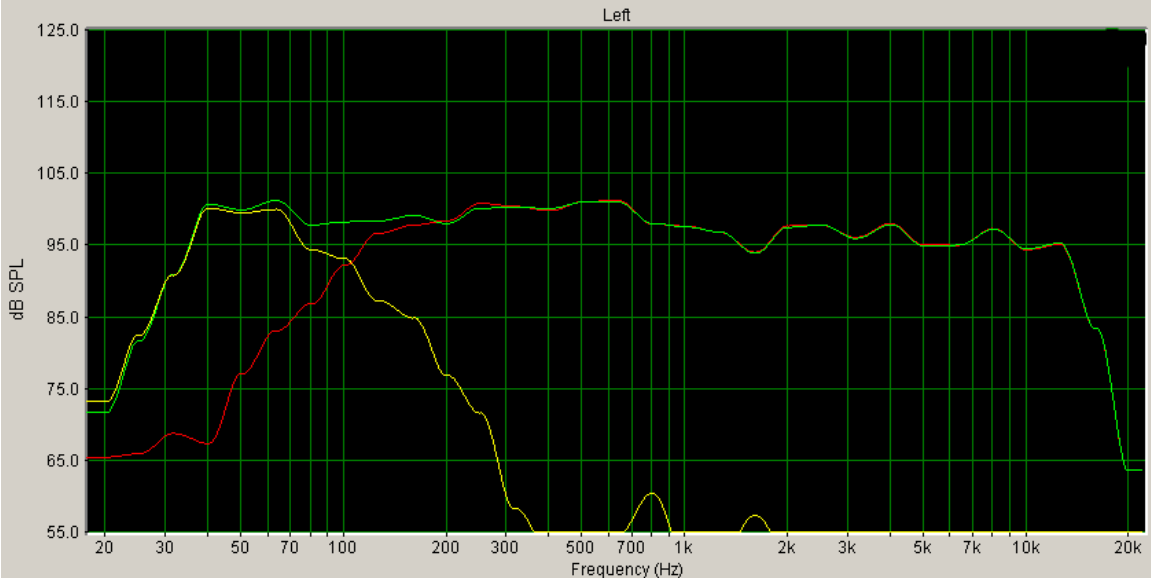
Real time FFT, in room, 2.5 m

Butterworth 24 dB / octave @ 90 Hz / in phase



Real time FFT, in room, 2.5 m

Linkwitz-Riley 24 dB / octave @ 100 Hz for RLX-18 and 90 Hz for RLX-12



Real time FFT, in room, 2.5 m

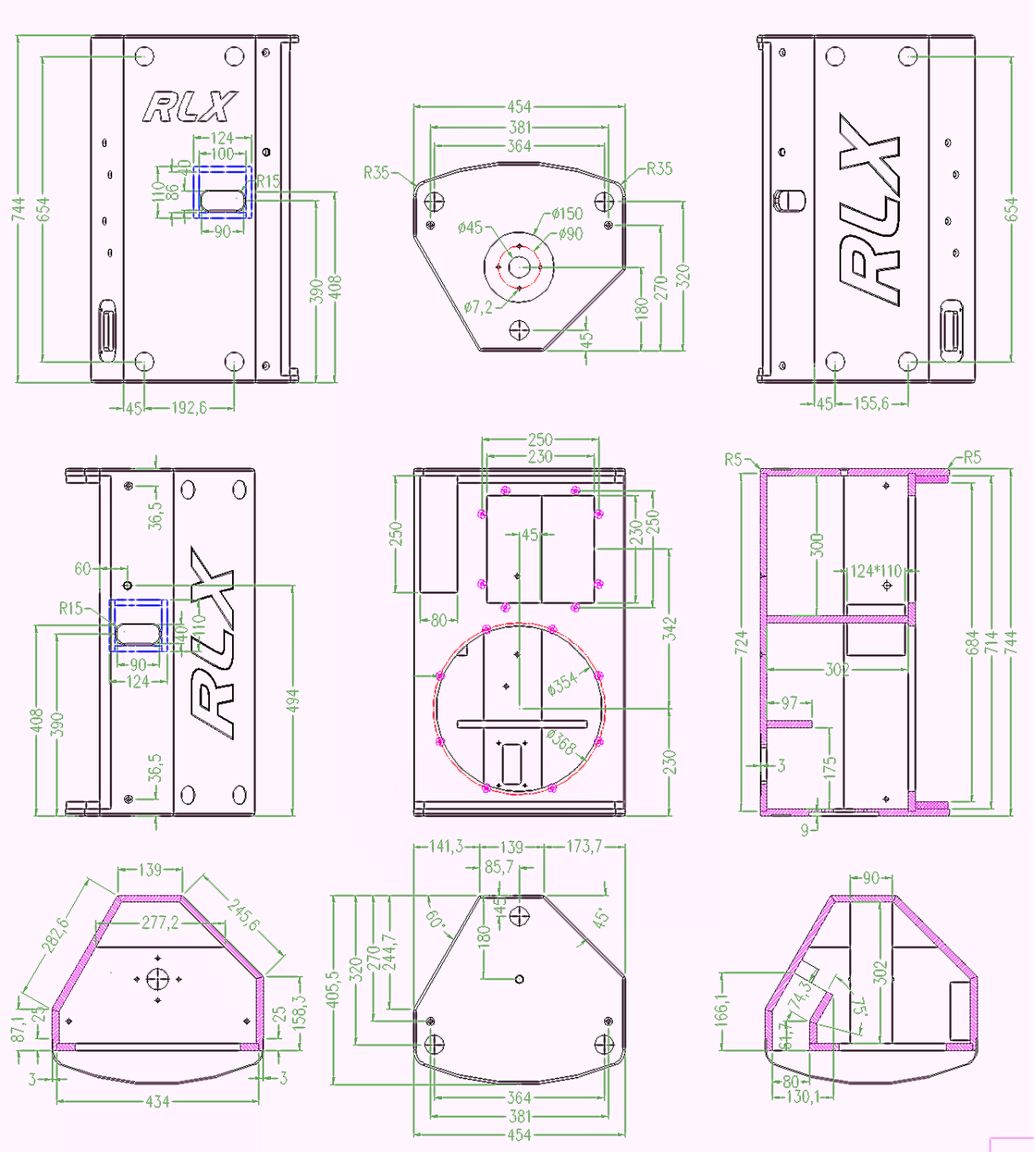
Notes:
1. Gain structure was set to 1:1 for RLX-18 and RLX-15 subwoofer units. Depending on use, different voltage gains can be set to each unit.
2. Both units were placed in equal distances from the microphone. If another arrangement is to be chosen, delay adjustments should be set accordingly.

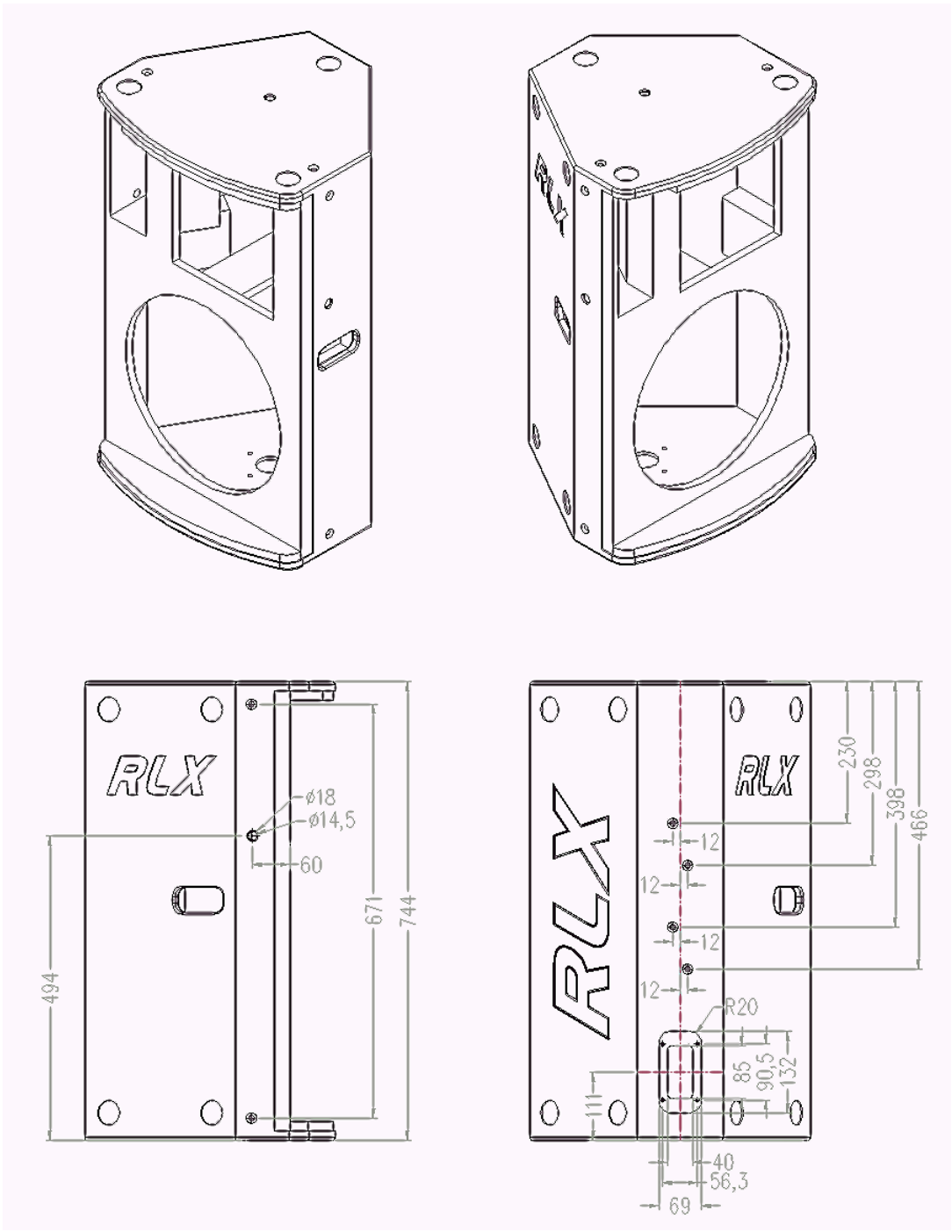
Recommended Filters

When used with a Loudspeaker digital management system such as Metro Audio Systems OnStage DSP 230 & DSP 240 units, only little EQing is required to achieve a very smooth Frequency response curve. In typical halls with no special / odd acoustical behavior, the following filter suggestion will be most likely adequate to achieve a near-perfect response, at least in the near field:

Frequency	Gain	Q
1250 Hz	+3 dB	2.8

Architectural drawings





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