Mellow Acoustics FRONTRO Loudspeaker Specifications

General

The FrontRo is a hybrid electrostatic loudspeaker that is hand-built in England, using locally sourced materials and joinery, and embodies fresh design theory. It has a 12” electrostatic unit that handles the mid-range and treble frequencies (600 Hz to 20 kHz), while the conventional 5.25” dynamic woofer handles the lower midrange and bass down to the lowest note on a double bass or bass guitar (40 Hz). The lower limit is constrained by the size of the enclosure which is designed to be as unobtrusive as possible in the home. Deeper bass may be obtained using a sub-woofer that can be tucked away discretely in a corner or behind a sofa. A major advantage of a hybrid electrostatic loudspeaker is that it is less sensitive to room placement than a full-range electrostatic design and can be placed closer to rear walls, although we recommend a clearance distance of 40 cm or more.

The FrontRo is a passive loudspeaker, which means that you can choose whatever amplifier and partnering equipment, such as a turntable or streaming device, that you wish to use. The standard wood finish is light oak, but for a small premium you may order a pair in a veneer of your own choice such as American walnut. Grille cloths are available in grey, navy or burgundy. Underneath the cloth of the electrostatic unit is a special screen that excludes dust and moisture to ensure long term reliability.

Connections

On the rear panel are two pairs of banana/binding terminals for connection to an amplifier. One pair connects the woofer while the other pair connects the electrostatic unit. Normally these are linked together so that a single stereo amplifier can be used with a single twin lead. However, some users may wish to use separate leads for the woofer and electrostatic unit or even separate amplifiers to obtain the very highest level of perfection, in which case the links should be removed. It is essential to ensure the polarity is correct. In other words, the red terminal on the amplifier connects to the red terminal on the loudspeaker and same applies for the black terminals. Also located on the back panel is a power socket for connecting to the mains. This provides the polarizing or bias supply for the electrostatic unit. It draws very little power and can therefore be plugged in permanently.

Amplifier

The amplifier should be rated 25 to100 W. The electrostatic unit has its own input protection circuit which clamps the input voltage at 20 V maximum. This corresponds to a nominal 25 W into 8 Ω. If the output from the amplifier is increased above this, the current will rise sharply until a PTC fuse is tripped and causes the electrostatic unit to be disconnected. However, the connection is restored after the volume is turned right down. There is no such protection circuit for the woofer which can take peaks of up to 100 W.

Positioning

The best way to position the FrontRo loudspeakers is to start with an equilateral triangle formation. It other words, place them either side of your favorite listening position the same distance apart as each one is from you. This distance is quite arbitrary and will depend on the size of the room. Each loudspeaker should be at least 40 cm away from the rear wall and the walls either side. Ideally, your seat should be at least 40 cm away from the wall behind you. In larger rooms, these clearance distances should be increased.

Next, you can start experimenting. Bringing the loudspeakers closer together will reinforce the central image, which is typically the lead singer, but will reduce the apparent width of the sound stage. It can also make the midrange sound a little tubby. Pointing the loudspeakers towards you (toeing in), rather than towards the opposite wall, will give the brightest treble, but the angle will also affect the apparent width of the sound stage versus the central image, depending on the distance from the side walls.

The FrontRo is supplied with conical feet that may be fitted to provide isolation from the floor and can be adjusted to vary the rake angle of the electrostatic unit so that it points directly towards the listener.

Technical description

The electrostatic unit comprises a charged membrane sandwiched between two perforated boards, or stators, which have copper rings on them. The copper rings are driven by the high signal voltage which is fed from tappings on a delay line to each of the rings. The signal creates an electric field which pulls the charged membrane back and forth to produces sound waves that pass through the perforations in the stators. It is the same electrostatic force that makes your hair stand on end when you rub a balloon on your clothes and hold it near your head.

Because of the delay line, sound emanates from the center first and then each ring in turn until it comes from the perimeter, by which time the sound from the center is some distance away. Hence, a hemispherical wave-front is produced which spreads out in all directions like the ripples that are produced by throwing a stone in a pond. Otherwise, high frequencies would be beamed towards the listener like a laser.

The woofer box is made of half-inch thick birch plywood that is heavily damped with a special lining material, like the famous BBC monitors. Inside the woofer box are two circuit boards. The wires from the terminals and power socket on the rear panel lead to the EHT board on which there is a crossover network, a switch-mode power supply that generates the 2000 V polarizing voltage to charge the electrostatic membrane, and two audio stepping-up transformers to drive each of the stators of the electrostatic unit. However, between the transformers and stators are a pair of delay lines which are mounted on a separate delay board. Tappings from each delay line are connected via one of two ribbon cables to the copper rings on each stator.

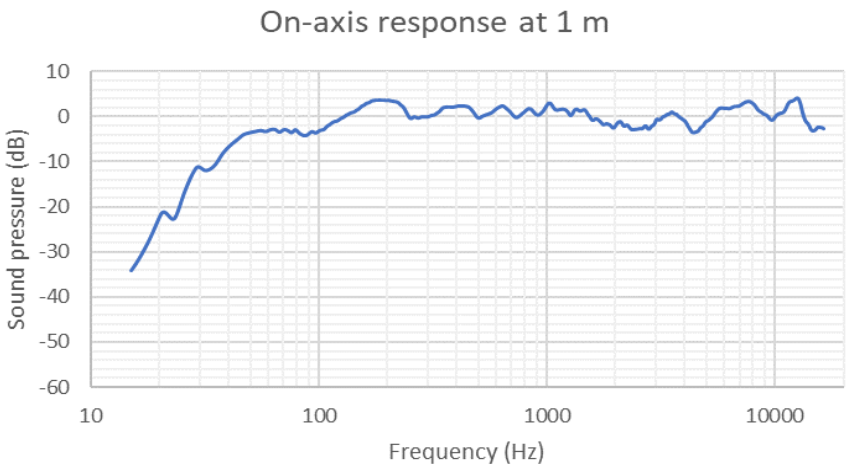
Technical specifications

Overall dimensions (without feet): 762 mm (H) x 494 mm (W) x 291 mm (D).

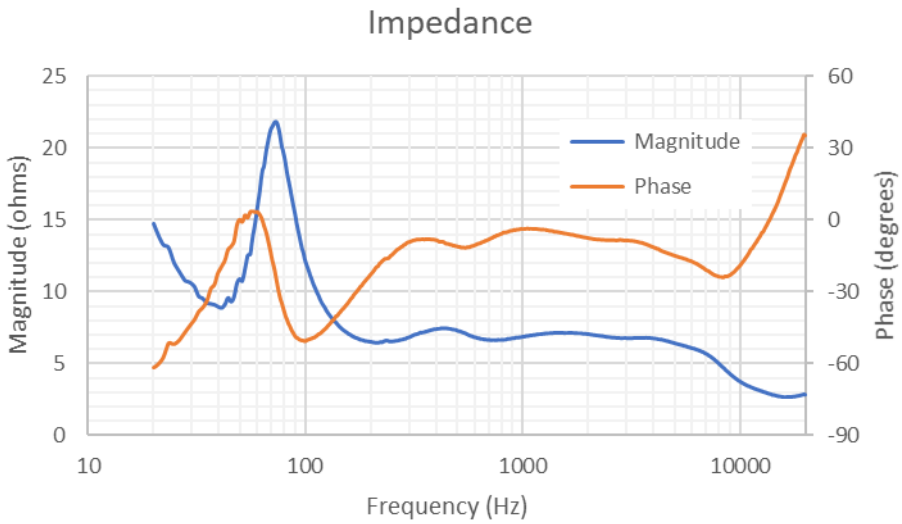
Weight 10.1 kg

Recommended amplifier power rating: 25 to 100 W

Frequency response: 40 Hz to 20 kHz



Input impedance: nominal 8 ohms.



Sensitivity: 84 dB @ 1m for 2.83 V_{RMS}.

Maximum output: 98dB SPL from electrostatic unit for 14 V_{RMS} (input protected).

Crossover frequency: 600 Hz, 1st-order, time-correct

Mains connection: 240 V, 4 mA