



S-12 Subwoofer

Product User Manual
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DECLARATION OF CONFORMITY



The products contained within this manual conform to the requirements of the EMC Directive 89/336/EEC, amended by 92/31/EEC and to the requirements of the Low Voltage Directive 73/23/EEC amended by 93/68/EEC.

EMC Emission EN55103-1:1996

Immunity EN55103-2:1996

Electrical Safety EN60065:1993

RECYCLING



This product and its packaging constitute the applicable product according to the WEEE directive. Please ensure that at the end of the working life of this product, it is disposed of sensibly in accordance with local and national recycling regulations. The packaging supplied with this product is recyclable. Please retain all packaging, however if disposing of this packaging please ensure that you comply with local recycling regulations. These products also all comply to the RoHS Directive 2002/95/EC.

1.0 - Introduction

Thank you for purchasing the S-12 subwoofer from EM Acoustics. This product has been designed and rigorously tested to give you the utmost in sonic performance and many years of reliable, trouble-free operation. Please take the time to read this user manual thoroughly to ensure you get the best performance from your system and to ensure you set it up correctly and safely. If you have any questions or are in any doubt whatsoever about any aspect of your new product, please do not hesitate to contact us directly or your local EM Acoustics representative.

The S-12 is a compact reflex subwoofer, intended for a wide variety of low frequency applications in small to medium applications. The S-12 is equally at home in permanent installations as well mobile applications due to its rugged construction. A state-of-the-art 12" high-excursion drive unit allows a surprising amount of SPL and low frequency extension from a compact and lightweight cabinet.

This manual contains all the information you should need on topics of set up, amplifier connection and basic service. If you feel we have missed anything, or you have a question not covered by this manual, please visit our website www.emacoustics.co.uk and send us a message or give us a call - we're only too happy to help.

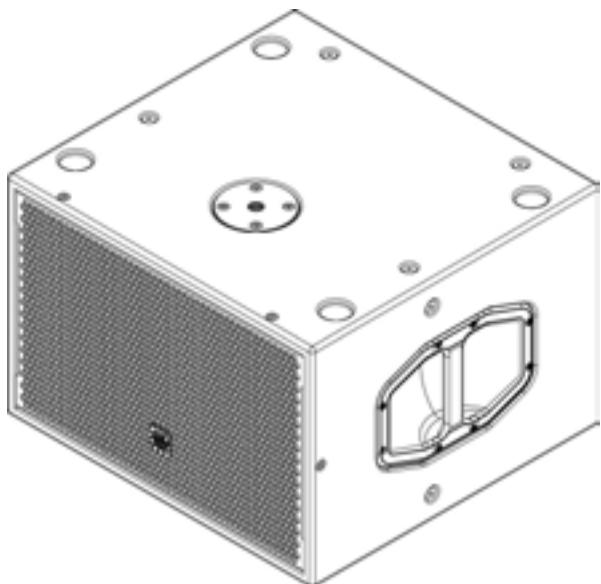
Unpacking

Please take care when unpacking your loudspeaker system. Once unpacked, please inspect each enclosure thoroughly for any transit damage and in the case of any damage please notify your carrier immediately. It is the responsibility of you, the consignee, to instigate any claim. Please retain all original packaging in case of future re-shipment.

2.0 - S-12 Subwoofer

S-12

Compact reflex subwoofer



FEATURES & BENEFITS

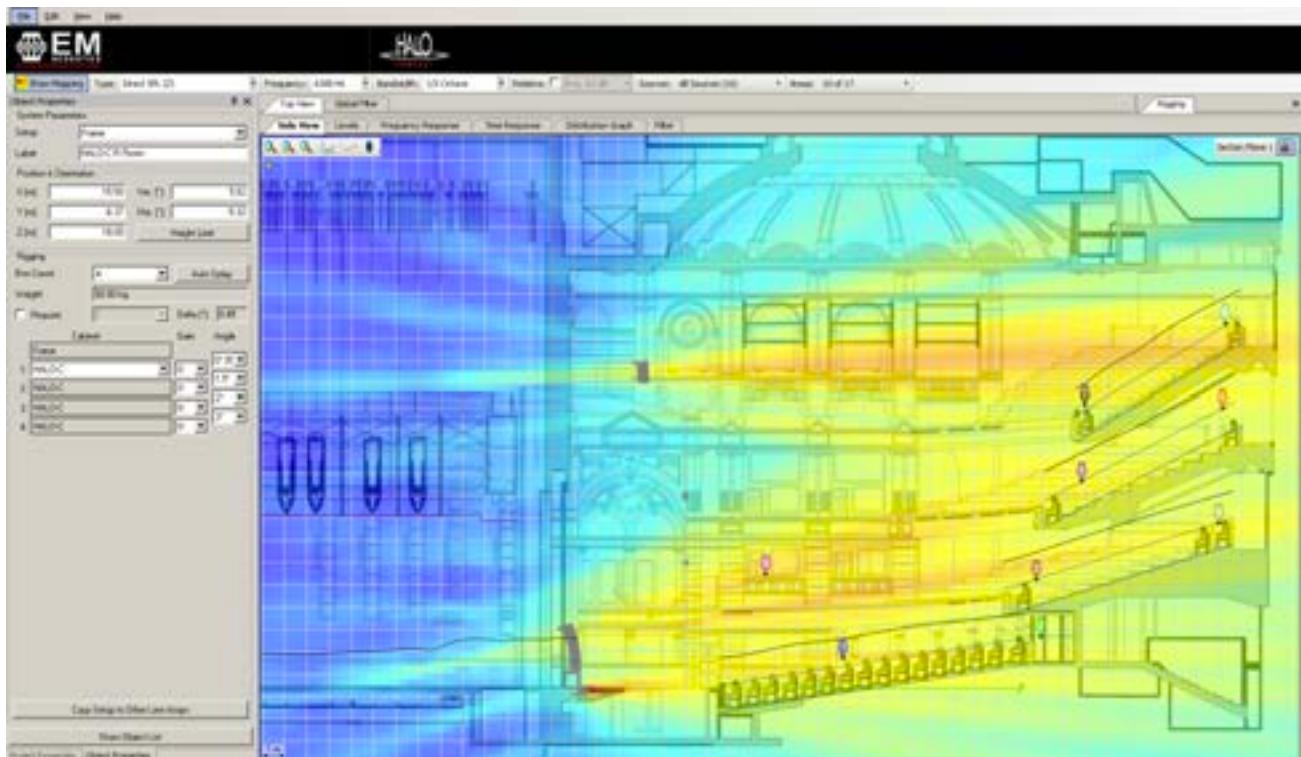
- Signature EM Acoustics "maximum headroom" design approach ensures consistency of performance regardless of SPL level.
- Integral M20 threaded pole adapter for mounting of fullrange loudspeakers.
- Multiple M10 threaded flying points for temporary and permanent installation.
- Enclosure coated with 3-step polyurethane process - ensuring the cabinets are not only weather resistant but more resilient to impact damage.
- Various features and accessories for easy moving & handling.
- Single amplifier channel required.

KEY SPECIFICATIONS

ENCLOSURE TYPE:	Compact reflex subwoofer
DRIVE UNITS:	1 x 12" LF drive unit
FREQUENCY RESPONSE:	40Hz - 150Hz +/-3dB
NOMINAL DISPERSION1:	omniirectional
MAXIMUM SPL:	124dB continuous, 130 dB peak
NOMINAL IMPEDANCE:	8 ohms
DIMENSIONS (HxWxD):	360 (14.2) x 530 (20.9) x 500 (19.7) mm/(ins)
NET/SHIPPING WEIGHT:	29/30kg (63.8/66lbs)

3.0 - Simulation

Ease Focus 3



For acoustic reasons it is advised that users familiarize themselves with Ease Focus 3 - this system provides the user with accurate simulations for setting up S-12 subwoofers.

Ease Focus 3 can be downloaded for free from the AFMG website at <http://focus.afmg.eu> and is currently available as a stand-alone application for Windows (XP or Higher) only. It can also be downloaded directly from the [EM Acoustics website](http://www.em-acoustics.com) with all the current product files embedded.

Tutorials for Ease Focus 3 are available from with the application itself.

For training on the design and implementation of S-12 subwoofers including the specific use of Ease Focus 3, please contact your local distributor.

4.0 - Safety Considerations

General Considerations in use

Loudspeaker systems are potentially dangerous objects if used incorrectly. Please ensure that you read this section fully, and contact EM Acoustics or your local dealer should you be in any doubt over correct operation procedures.

Personal Injury

Never stand in the immediate vicinity of loudspeakers when in use at high level. Professional loudspeaker systems are capable of producing sound pressure levels which can cause permanent damage to human hearing. Levels in excess of 90dB can cause hearing damage if people are exposed to them over a long period of time, so care and attention must be used for both staff and audience members.

When deploying loudspeaker systems on the ground or when flown, please take careful note of the following important safety considerations:

- Only use accessories and flying hardware supplied or approved by EM Acoustics for flying or transporting loudspeaker systems. Pay close attention to specific instructions, especially those considering maximum load capabilities as detailed in the appropriate user manuals or on the legend labels on the accessories themselves.
- Ensure all additional accessories, fasteners and secondary safeties are of an appropriate size, working load limit and safety factor.
- All loudspeakers and accessories should be regularly inspected for signs of wear and tear, and any damaged parts should be replaced.
- All load bearing parts and assembly bolts on accessories should be regularly checked to ensure they are tight and not worn.

Ground Stacking

- Ensure that the floor or stage surface can withstand the weight of the system.
- Wherever possible, avoid high stacks and use ratchet straps to secure loudspeakers together. Please also remember that vibrations from subwoofer systems can shake other loudspeakers out of place, which may present a toppling hazard. The use of ratchet straps and non-slip material is recommended to prevent this.

Rigging and Suspension

Please see Chapter 5 for further information on the detailed rigging options for your loudspeaker system.

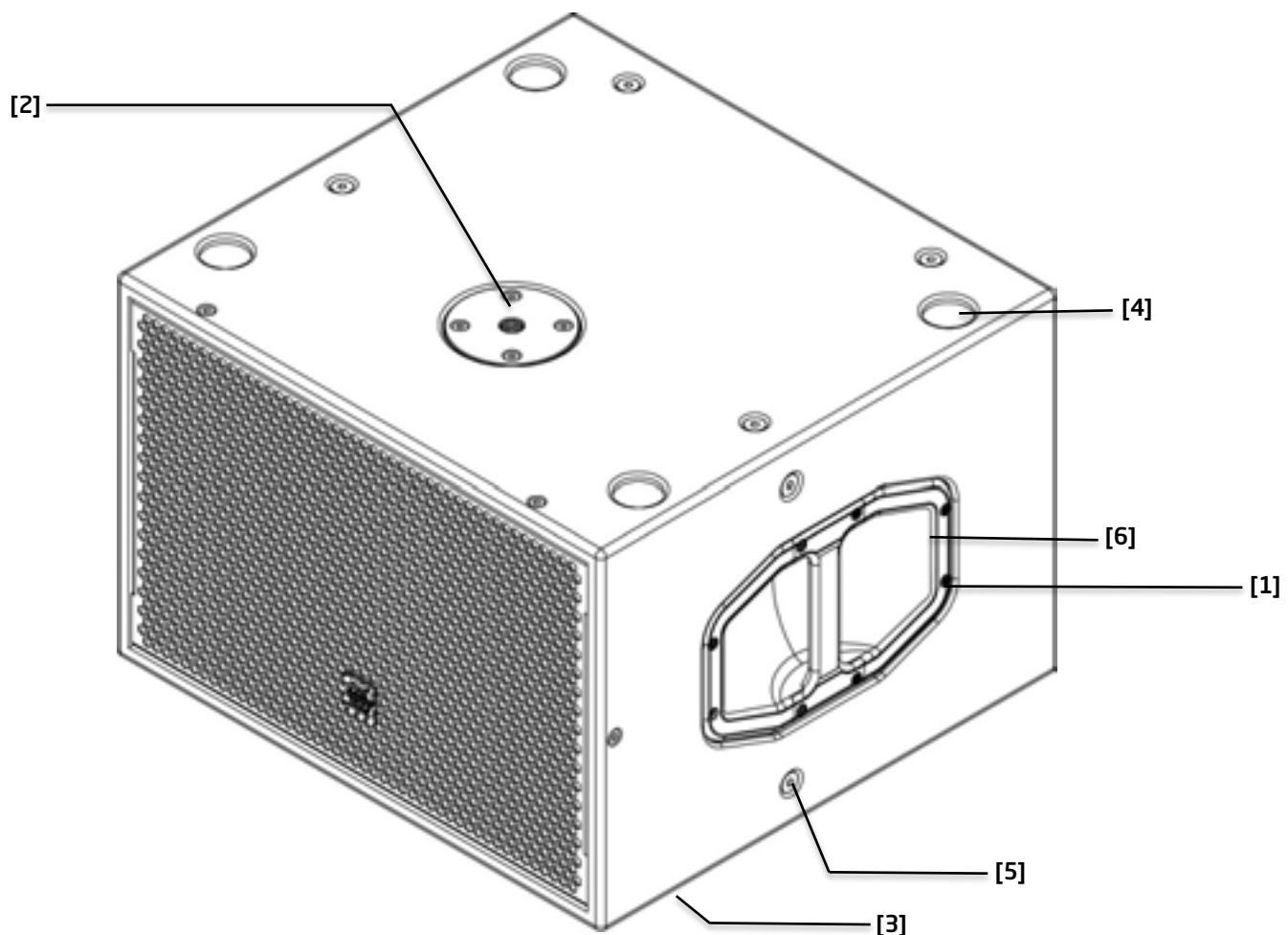
WARNING: The overhead suspension of loudspeakers is a very serious issue with potentially lethal consequences should anything go wrong. Rigging should only be carried out by experienced personnel following safe working practice. Should you be in any doubt whatsoever, please contact your local dealer who will be able to refer you to a suitable rigging company.

Material Damage from Magnetism

Loudspeakers produce a static magnetic field at all times - even when not in use. Certain devices are susceptible to external magnetism, and as such a safe distance should be maintained to prevent damage. It is recommended that a safe distance of 0.5m (1.5ft) is maintained from loudspeakers when stored, transported and in use, from devices such as computer hard drives, magnetic media, bank cards to remove the risk of corruption. Larger distances may be required for some older cathode ray tube displays.

5.0 - Rigging & Mounting Options

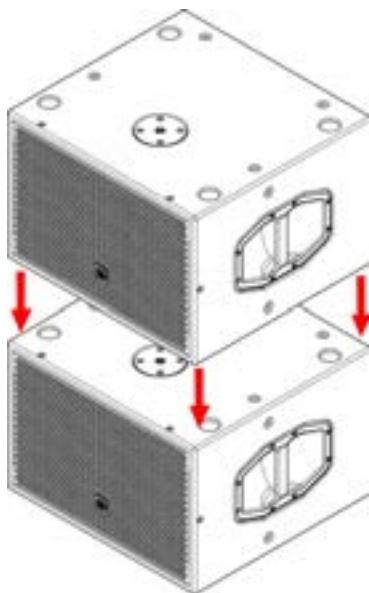
5.1 - S-12 Cabinet Hardware Overview



- 1 Lifting & Carrying Handle
- 2 M20 threaded pole adapter
- 3 Rubber foot (underneath)
- 4 Stacking recess
- 5 M10 threaded flying point

5.2 - Stacking S-12 subwoofers

The S-12 subwoofer has four rubber feet on the underneath, and matching recesses in the top face of the cabinet. When stacking S-12 subwoofers, this provides a neat and clear way of creating a tidy stack.

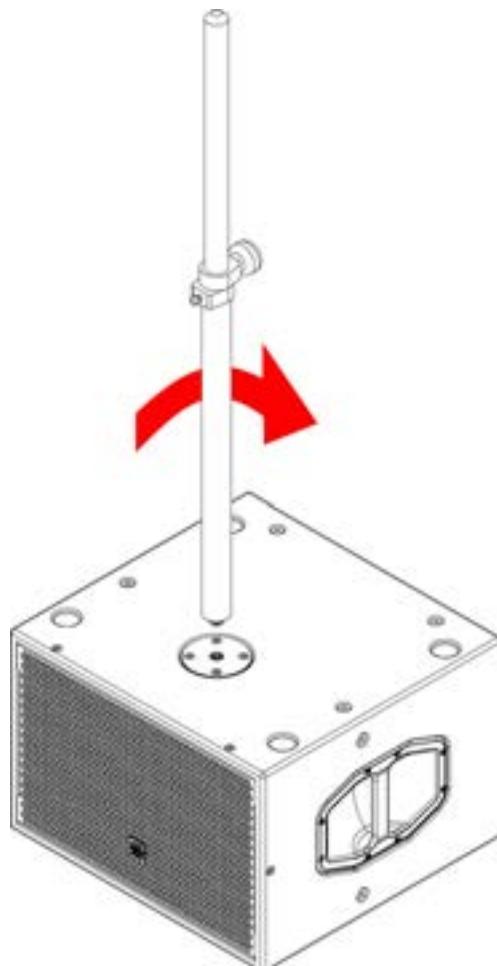


PLEASE BE AWARE THAT STACKS SHOULD ALWAYS BE PLACED ON LEVEL GROUND, AND STRAPS OR SIMILAR SHOULD BE USED TO SECURE THEM.

5.3 - Using the M20 threaded pole adapter

The S-12 has an M20 threaded adaptor in the top face, designed to receive M20 threaded pole fittings such as the EM Acoustics DP-01 or DP-02. To fit such a device, carefully start the threaded end in the fitting, and continue to turn clockwise until the flange of the pole is secure against the threaded adapter.

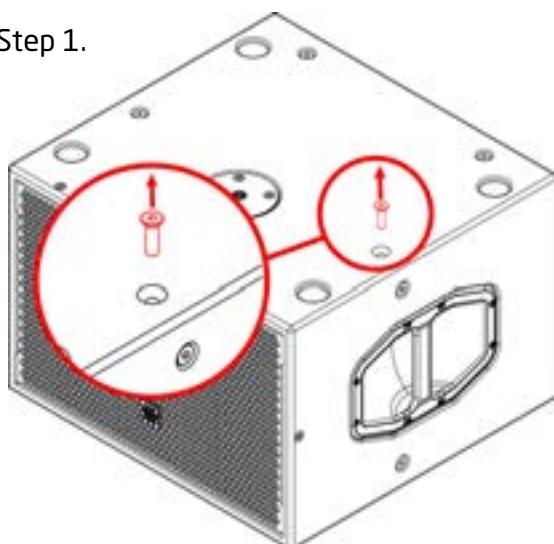
Ensure that the pole is screwed fully into the adapter before mounting any loudspeaker on to the pole.



5.4 - Flying the S-12 subwoofer

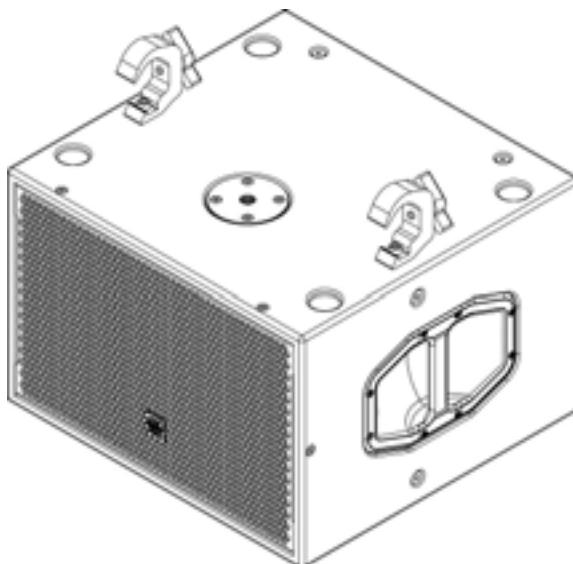
The S-12 has a total of 16 M10 threaded fittings internal to the cabinet woodwork - each one has an M10 countersunk socket bolt fitted in the factory. Various methods for installation can be used - from forged shoulder eyebolts and steel wires to hook clamps.

Step 1.



Using a 6mm Allen key, remove the relevant countersunk M10 bolts on the cabinet where you will be attaching your chosen suspension method.

Step 2.



Secure your chosen attachment method to the loudspeaker. Ensure all fittings are tight before suspending the loudspeaker.

Any of the S-12 points can be used for suspension, however if using the points as illustrated above, the S-12 will sit straight and level as those points are positioned on the cabinet Centre of Gravity.

Always ensure that a secondary safety is used when suspending any loudspeaker.

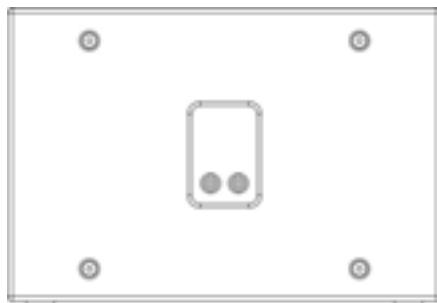
6.0 - Powering the System

The S-12 subwoofer can be powered from any amplifier & DSP combinations with the relevant high & low pass filter, and limiter settings. However, due to the self-contained nature of the package, the use of DQ Series advanced system amplifiers is highly recommended. The use of DQ Series amplifiers provides a neat and flexible system that will encompass all requirements for the system to function correctly, as well as providing user control for room EQ and system alignment.

6.1 - Amplifier and Processing Requirements

6.1.1 - Connections

The S-12 requires only a single amplifier channel. Inputs to the S-12 enclosure are on Neutrik SpeakON NL4 as illustrated below.



Two-core cable should be used for connecting S-12 subwoofers, and the connections are as follows:

SpeakON connection	1+	1-	2+	2-
Drive unit connection	LF +	LF -	Link Through	Link Through

6.1.2 - Connector Options

The S-12 is supplied as standard with two NL4 connectors. For more demanding environments, S-12 subwoofers can be supplied with other options by special order - please contact EM Acoustics to discuss your requirement.

6.1.3 - Amplifier Requirements

The S-12 is a very powerful subwoofer, making use of some of the most advanced drive units available in the industry today. It is good practice to ensure that your amplifier can deliver at least double the RMS power handling of the loudspeaker to ensure full headroom, and as such the amplifier requirement is:

Product	RMS Power Handling	Recommended Min. Amplifier Power
S-12	700W @ 8 ohms	1400W @ 8 ohms

A loudspeaker is far more likely to be damaged by an under-powered amplifier working too hard, than an over-powered amplifier working well within its limits.

All of the DQ Series advanced system amplifiers can be used to power the S-12.

The following table shows the maximum number of S-12 that can be connected per channel on the various different amplifiers:

Amplifier	Max S-12 per channel
DQ6	1
DQ10	2
DQ20	4

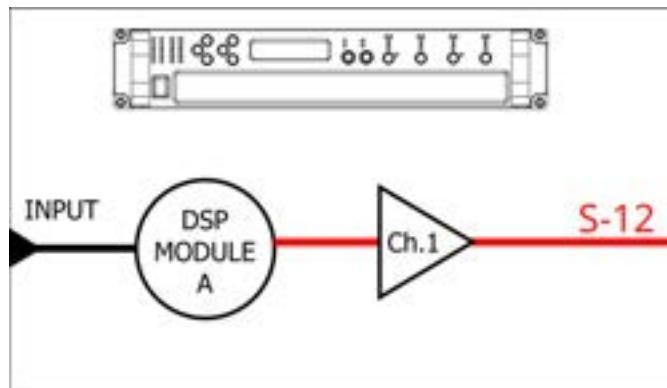
6.1.4 - Processing Requirements

The S-12 requires active high and low pass filters, and appropriate limiter settings. If not using DQ Series amplifiers, or the DSC48 Digital System Controller, then a suitable DSP system must be used in conjunction with your S-12 to prevent damage to the subwoofer. Check the EM Acoustics website for the most up-to-date DSP settings for the S-12.

6.2 - Presets and Settings

6.2.1 - Standard S-12 Preset

When used with a DQ Series amplifier S-12 subwoofers require only a single amplifier channel, and as such the preset recalled will only require one output from your DQ Series amplifier.



6.2.2 - Geometric Delay

Appropriate delay will need to be applied to account for physical location differences between different elements of your system - for example time-aligning subwoofers to the main system. The use of SMAART or similar can make this task a great deal simpler and faster.

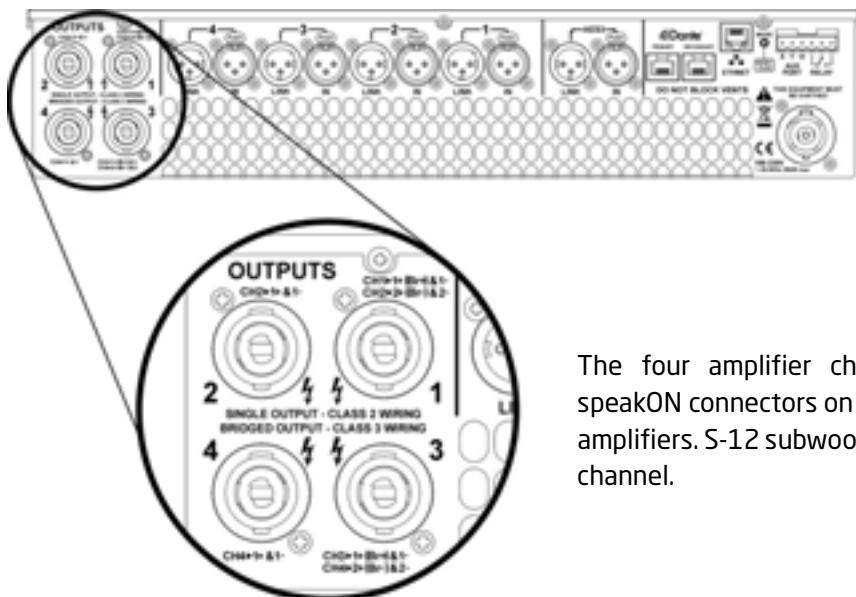
6.2.3 - Applying EQ

The presets are intended to be a starting point for your system and will almost certainly require tuning on-site dependent on room characteristics, the rest of your system design and the system voicing you are aiming for. The S-12 is designed with a significant amount of system headroom, so applying EQ is perfectly acceptable.

6.3 - Use with the DQ Series Advanced System Amplifiers

The S-12 will perform best when using DQ Series advanced system amplifiers, as not only are they state-of-the-art amplifiers, but the onboard DSP provides appropriate high/low pass filter settings and limiters to get the best from your subwoofers. Please refer to the DQ Series User Manual for detailed information on using the amplifiers and the System Engineer software.

6.3.1 - Connections



The four amplifier channels appear on four speakON connectors on the rear of the DQ Series amplifiers. S-12 subwoofers require one amplifier channel.

6.3.2 - Preset Recall

The S-12 preset is pre-installed on the DQ amplifiers, and as such can be used following the normal preset recall procedure. The presets available are:

S-12.Sub Standard S-12 subwoofer preset

As mentioned above, these presets are intended to be a starting point and additional work may be required depending on the venue, the style of content and the end result you are looking for.



6.4 - System Connectivity

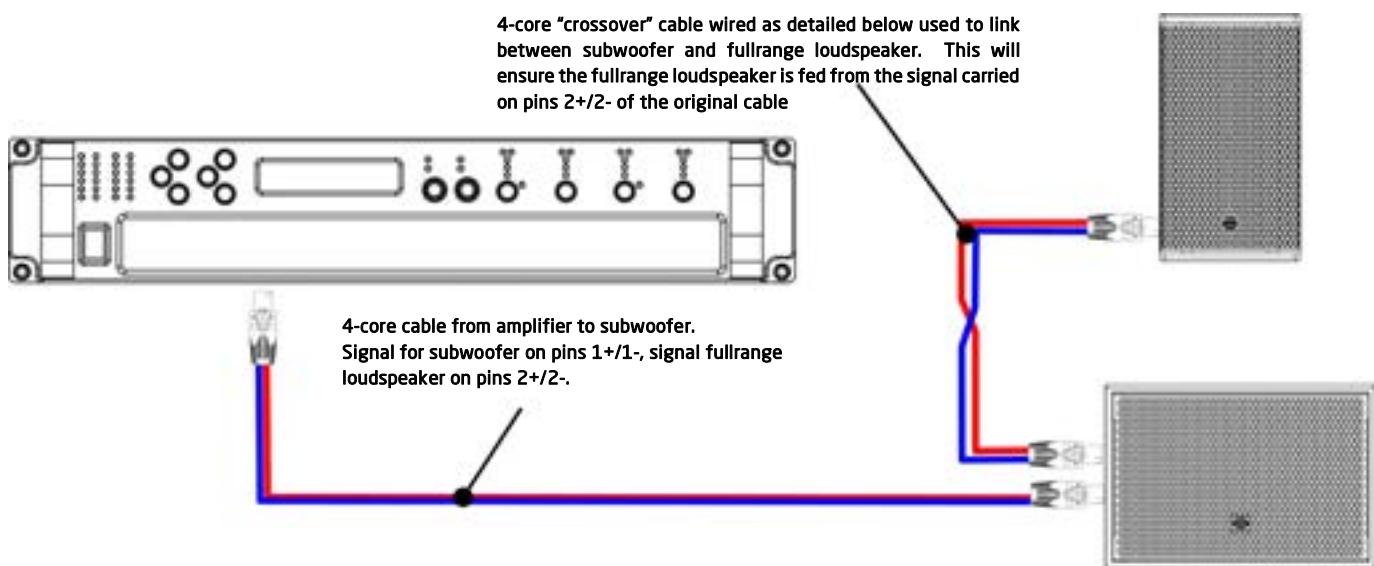
6.4.1 - Cable Length and Specification

All cables add to the system impedance, and as such careful selection is required depending on your amplifier setup and overall system impedance. Cables with a cross sectional area of less than 2.5mm^2 should not be used. Recommended maximum cable lengths are given below:

Conductor Area	Maximum Recommended Cable Length		
	2 ohms	4 ohms	8 ohms
2.5mm^2 (14 AWG)	15m	30m	60m
4.0mm^2 (12 AWG)	20m	40m	80m
6.0mm^2 (10 AWG)	30m	60m	120m

6.4.2 - Crossover Cable Use

The use of a pin-swap or “crossover” cable can allow for neater cable solutions when sending different amplifier signals to the same location. Because pins 2+/2- are linked through inside all EM Acoustics loudspeakers, using a 4-core cable to one loudspeaker (carrying two different signals) allows a crossover cable to be used to link out of the first loudspeaker into another, thereby feeding it from a separate signal.



Connector A Pin	Connector B Pin
1+	2+
1-	2-
2+	1+
2-	1-

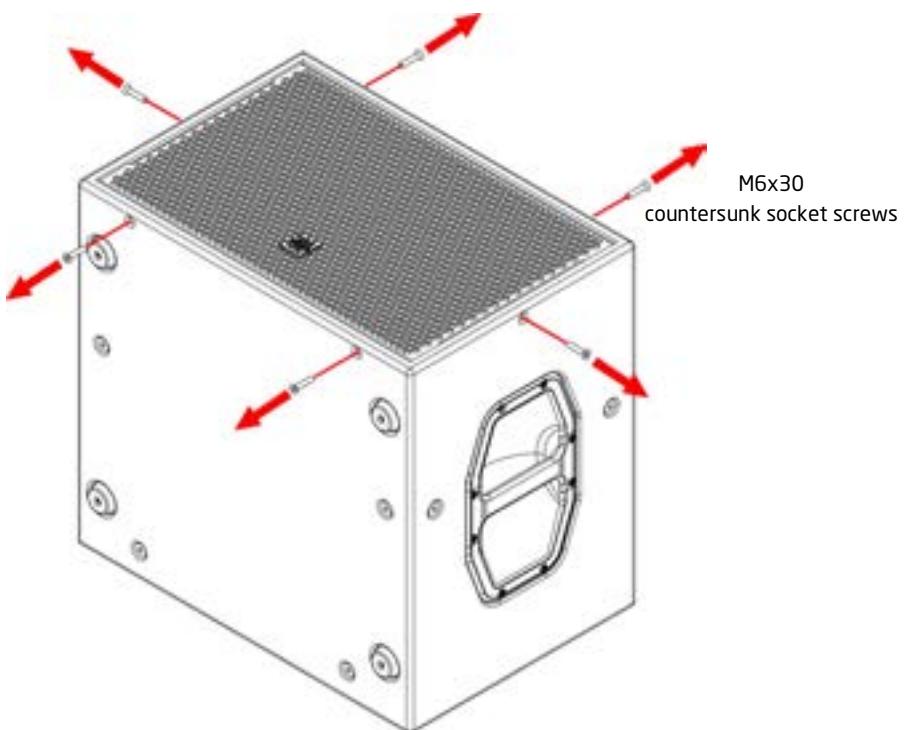
7.0 - Servicing Information

All S-12 components can be removed for service purposes if required, using the minimum of tools.

7.1 - S-12: Removing the grille

TOOLS REQUIRED: 4mm Allen key

1. Lie the enclosure on its' back and remove the six M6x30 countersunk socket screws using a 4mm Allen key, and then lift the grille clear of the cabinet.

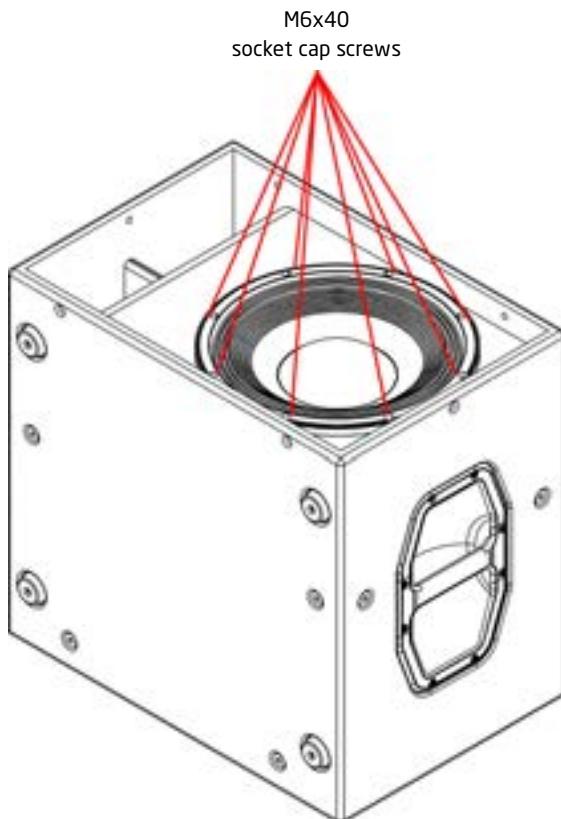


2. To replace the grille, position the grille on the front of the S-12 (logo badge should be in the centre at the bottom of the grille when sat on its feet) and ensure the threaded fittings on the grille are lined up with the mounting holes. Replace each of the six M6x30 countersunk bolts and ensure all machine screws are started in their threads before beginning to tighten. Ensure they are all tightened evenly so that the grille sits straight and flat and does not rattle.

7.2 - S-12: Removing the drive units

TOOLS REQUIRED: 5mm Allen key

1. Complete step 7.1 above to remove the grille.
2. Using a 5mm Allen key, remove the eight M6x40 socket cap screws that secure the drive unit. Ensure that you remove the spring washers from the recesses as well as the machine screws.



3. Lift the drive unit clear of the mounting hole and disconnect the two cables - note the polarity for reconnection (red to positive, black to negative).
4. To replace the drive unit, ensure the adhesive gasket on the rear of the 12" is intact and complete - replace if necessary. Reconnect the cables to the drive unit (note the red cable goes to the positive (red) terminal, and the black cable goes to the negative (black) terminal on the drive unit) and then sit the drive unit into its mounting location, ensuring that the mounting holes line up.
5. Replace the M6x40 socket cap machine screws with their spring washers and ensure all machine screws are started in their threads before tightening. Tighten opposing bolts, working around the drive unit until all bolts are appropriately tightened.
6. Replace the grille as described above.

Appendix A - Technical Specifications

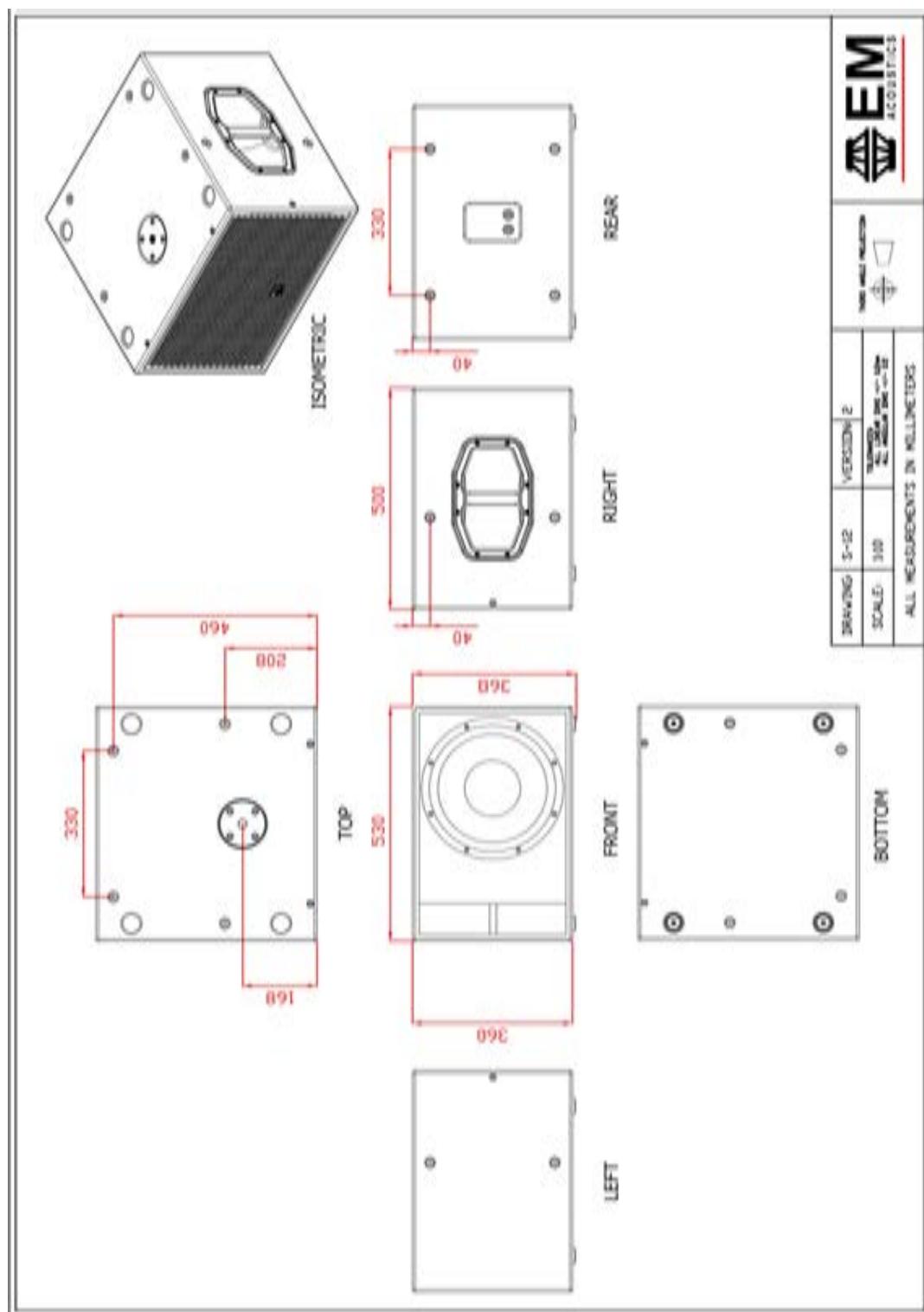
S-12 compact reflex subwoofer

Dimensions (HxWxD):	360 x 530 x 500mm (14.2" x 20.9" x 19.7")
Net/Shipping Weight:	29kg/30kg (63.8/66lbs)
Frequency Response (+/- 3dB) ¹ :	40Hz - 150Hz
Dispersion ³ :	Omnidirectional
Drive Units:	1 x 4" (102mm) voice coil 12" (305mm) LF drive unit
Power Handling:	LF: 700W RMS, 1400W program
Maximum SPL:	124dB continuous, 130dB peak
Nominal Impedance:	8 ohms
Crossover:	External active
Enclosures per amp channel:	DQ6: 1 DQ10: 2 DQ20: 4
Connectors:	2 x Neutrik SpeakON™ NL4
Enclosure:	15mm (5/8") multi-laminate birch plywood, rebated, screwed and glued. Finished in polyurethane textured finish
Rigging & Hardware:	16 x M10 threaded rigging points. M20 threaded pole adapter. Single flush handle, rubber feet & stacking recesses.
Grille:	Mesh-backed perforated steel
Options:	Colours/extended weather protection

Notes on measurement conditions:

¹Measured on-axis at 2m in an anechoic environment and referenced to 1m. ²Measured in half-space at 2m with 4W sine wave input and referenced to 1m. ³Nominal dispersion, measured in an anechoic environment and averaged over stated bandwidth. ⁴Calculated and verified by subjective listening test of familiar program material.

Appendix B - Technical Drawings



Appendix C - Spare Parts List

Order Code	Description
01A032	DU-1211 replacement 8 ohm 12" LF drive unit
04A043	RFG-S12 replacement grille/fabric for S-12

Appendix D - Warranty Information

Limited Warranty

This EM Acoustics loudspeaker product is warranted to the original end-user purchaser and all subsequent owners for a period of **five (5) years** from the original date of purchase.

Warranty Coverage

This warranty covers defects in materials and workmanship. It does not include:

- Damage or failure caused by accident, misuse, neglect, abuse or modification by any person other than an authorised EM Acoustics representative.
- Damage or failure caused by operating the loudspeaker product contrary to the instructions contained within this manual.
- Damage caused during shipment.
- Claims based on any misrepresentation by the seller.
- Products which contain anything other than the original components (or EM Acoustics factory supplied spare parts).
- Products on which the serial number has been removed, altered or defaced.

Returning your EM Acoustics loudspeaker

Should your EM Acoustics loudspeaker develop a fault, please return it (freight prepaid) in its original packaging, along with proof of purchase to your local dealer or to:

EM Acoustics (Returns Department), Building 19.11, Dunsfold Park, Cranleigh, Surrey, GU6 8TB, UK

including a description of the suspected fault. Serial numbers must be quoted in all correspondence relating to the claim. EM Acoustics or its representatives are in no way liable for any loss or damage in transit, and hence it is recommended that the sender insure the shipment. EM Acoustics will pay for return freight should the repair be covered under warranty.

EM Acoustics' liability is to the replacement or repair (at our discretion) of any defective components, and as such are not liable for any incidental and consequential damages including (without limitation) injury to persons, damage to property or loss of use.

This warranty is exclusive and no other warranty is expressed or implied. This warranty is also in addition to - and in no way detracts from - your statutory rights as a consumer.