



ESP-12

compact two-way self-powered loudspeaker

Product User Manual
v2 November 2019

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DECLARATION OF CONFORMITY

DECLARATION OF CONFORMITY



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

Products Covered:

ESP-12

EMC Emission	EN55103-1
Immunity	EN55103-2
Electrical Safety	EN60065

This product complies with both the LVD (electrical safety) 73/23/EEC and EMC (electromagnetic compatibility) 89/336/EEC directives issues by the commission of the European community.

Compliance with these directives implies conformity with the following European standards:

EN60065	Product safety
EN55103-1	EMC emissions
EN55103-2	EMC immunity

This product is intended for the following electromagnetic environments: E1, E2; E3 & E4.

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.

Electrical Safety Instructions



CAUTION

**RISK OF ELECTRIC SHOCK
DO NOT OPEN**

**DO NOT EXPOSE TO
RAIN OR MOISTURE**

ATTENTION

**RISQUE DE CHOC ELECTRIQUE
NE PAS ENLEVER**

**NE PAS EXPOSER A LA
PLUIE NI A L'HUMIDITE**



IMPORTANT SAFETY INSTRUCTIONS

- 1 Read these instructions.
- 2 Keep these instructions.
- 3 Heed all warnings.
- 4 Follow all instructions.
- 5 Do not use this apparatus near water.
- 6 Clean only with dry cloth.
- 7 Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8 Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
- 9 Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
- 11 Only use attachments / accessories specified by the manufacturer.
- 12 Use only with the cart, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart / apparatus combination to avoid injury from tip-over.
- 13 Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14 Refer all servicing to qualified service personnel. Service is required when the apparatus has been damaged in any way, such as power-supply cord or plug damaged, liquid has been spilled or objects have fallen into the apparatus, this apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- 15 The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
- 16 Permanent disconnection from the mains supply is to be achieved by removing the supplied cord connector from the back of the unit. This connector must remain readily operable

SAFETY WARNING

Do not remove any covers, loosen any fixings or allow items to enter any aperture.

SAFETY WARNING

Replace the mains fuse only with a fuse of the same type

SAFETY WARNING

The rear of the product may get hot. Avoid direct skin contact during operation and for at least 5 minutes after power has been isolated.



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CONSIGNES DE SÉCURITÉ IMPORTANTES

- 1 Lisez ces instructions.
- 2 Conservez ces instructions.
- 3 Respectez tous les avertissements.
- 4 Suivez toutes les instructions.
- 5 Ne pas utiliser cet appareil près de l'eau.
- 6 Nettoyer uniquement avec un chiffon sec.
- 7 Ne pas bloquer les ouvertures de ventilation. Installer conformément aux instructions du fabricant.
- 8 Ne pas installer près de sources de chaleur telles que radiateurs, registres de chaleur, poêles ou autres appareils (y compris les amplificateurs) qui produisent de la chaleur.
- 9 Ne supprimez pas le dispositif de sécurité de la fiche polarisée ou mise à la terre. Une fiche polarisée possède deux lames dont l'une est plus large que l'autre. Une prise de terre a eu deux lames et une troisième broche de terre. La lame large ou la troisième broche sont fournies pour votre sécurité. Si la fiche fournie ne rentre pas dans votre prise, consultez un électricien pour remplacer la prise obsolète.
- 10 Protéger le cordon d'alimentation soit écrasé ou pincé, particulièrement au niveau des fiches, des prises et le point où ils sortent de l'appareil.
- 11 Utilisez uniquement les accessoires spécifiés par le fabricant.
- 12 Utilisez uniquement le chariot, le trépied, le support ou la table spécifiés par le fabricant, ou vendu avec l'appareil. Quand un chariot est utilisé, soyez prudent lorsque vous déplacez l'ensemble chariot / appareil afin d'éviter toute blessure en cas de chute.
- 13 Débranchez cet appareil pendant les orages ou lorsqu'il n'est pas utilisé pendant de longues périodes de temps.
- 14 Adressez-vous à un personnel qualifié. Une réparation est requise lorsque l'appareil a été endommagé de quelque façon que ce soit le cordon d'alimentation ou la fiche endommagé, du liquide a été renversé ou des objets sont tombés dans l'appareil, cet appareil a été exposé à la pluie ou à l'humidité, ne fonctionne pas normalement, ou s'il est tombé.
- 15 Le dispositif ne doit pas être exposé à des gouttes ou des éclaboussures et aucun objet rempli de liquides, tels que des vases, doit être placé sur l'appareil.
- 16 Déconnexion permanente de l'alimentation secteur doit être atteint en supprimant le connecteur du cordon fourni à l'arrière de l'unité. Ce connecteur doit être facilement utilisable.

AVERTISSEMENT DE SECURITE

Ne retirez pas les couvercles, ne desserrez pas les fixations et ne laissez aucune pièce s'introduire dans les ouvertures.

AVERTISSEMENT DE SECURITE

Ne remplacez le fusible de réseau principal que par un fusible du même type.

AVERTISSEMENT DE SECURITE

Le radiateur arrière de cet appareil devient chaud. Evitez tout contact direct avec la peau pendant le fonctionnement et au moins 5 minutes après la mise hors tension de l'appareil.

INSTALLATION INSTRUCTIONS

- 1 THIS PRODUCT MUST BE EARTHED. Use only a flexible cable or cord provided with a green or green and yellow core which must be connected to the protective earthing terminal of a suitable mains plug or the earthing terminal of the installation. The cord must be of maximum length 7.5 meters, rated SJ, SJT, or SJE, 10A minimum and be marked VW-1.
- 2 Do not install this equipment in an enclosed space. Do not limit free ventilation and movement of air around the back panel. Ensure that there is at least 100mm (4") of space around all sides of the product for ventilation.

FOR CUSTOMERS IN EUROPE

This product complies with both the LVD (electrical safety) 73/23/EEC and EMC (electromagnetic compatibility) 89/336/EEC directives issued by the commission of the European community.

Compliance with these directives implies conformity with the following European standards:

EN60065	Product safety
EN55103-1	EMC emissions
EN55103-2	EMC immunity

This product is intended for the following electromagnetic environments: E1, E2; E3 & E4.

FOR CUSTOMERS IN THE USA

This product has been tested for electrical safety and complies with:
UL60065 7th edition

DECLARATION OF CONFORMITY WITH FCC RULES

We, EM Acoustics Ltd. of Cranleigh, Surrey, GU6 8TB, England, declare under our sole responsibility that the device, ESP-12, complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FEDERAL COMMUNICATIONS COMMISSION NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential and commercial installation.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FOR CUSTOMERS IN CANADA

This product has been tested for electrical safety and complies with:
CA /CSA C22.2 No.60065-03

DECLARATION OF CONFORMITY WITH CANADIAN ICES-003

This Class I digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe I est conforme à la norme NMB-003 du Canada.

1.0 - Introduction

Thank you for purchasing the highly acclaimed ESP-12 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 ESP-12 is a compact 2-way loudspeaker, intended for a wide variety of discreet self-powered applications - from portable speech reinforcement through to small scale live music. The compact enclosure houses a coaxial 12" LF/1.3" HF neodymium drive unit which produces a consistent 80° conical coverage pattern. The onboard control and amplification package provides two channels of Class D amplification and state-of-the-art DSP to ensure sonic clarity and the utmost performance from your self-powered system.

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.

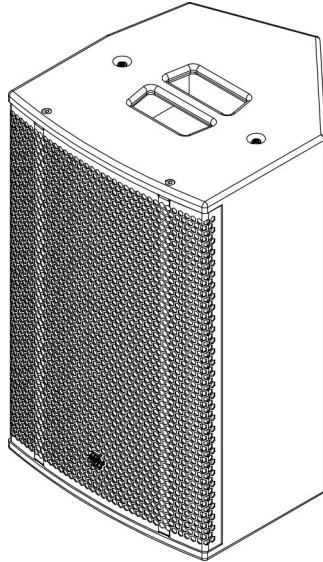
Unpacking

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 - ESP-12 & Accessories

ESP-12

Compact self-powered loudspeaker



FEATURES & BENEFITS

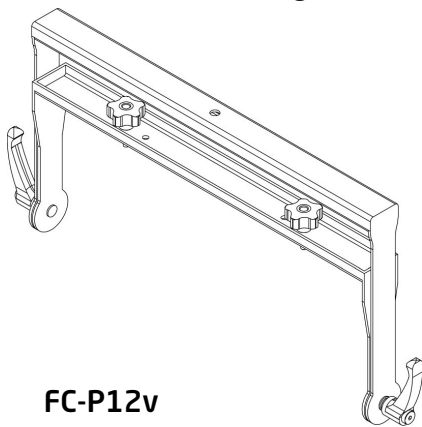
- Signature EM Acoustics "maximum headroom" design approach ensures consistency of performance regardless of SPL level.
- Multiple M10 threaded flying points for temporary and permanent installation.
- Enclosure coated with 3-step polyurethane process - ensuring the cabinets are more resilient to impact damage.
- Various rigging accessories available.
- Multi-angle enclosure allows use as a monitor as well as FOH.
- Onboard amplification and control electronics.
- Multiple presets available for different applications.

KEY SPECIFICATIONS

ENCLOSURE TYPE:	2-way coaxial, reflex loaded
DRIVE UNITS:	LF: 12" / HF: 1.3"
FREQUENCY RESPONSE:	60Hz - 20kHz +/-3dB
NOMINAL DISPERSION1:	80° conical
MAXIMUM SPL:	125dB continuous, 131dB peak
DIMENSIONS (HxWxD):	560 (22) x 390 (15.4) x 401 (15.8) mm/(ins)
NET/SHIPPING WEIGHT:	23/25.5kg (28.6/30.8lbs)

FC-P12h

Horizontal mounting cradle



The FC-P12h is a simple and effective means of mounting the ESP-12 in both temporary and permanent applications.

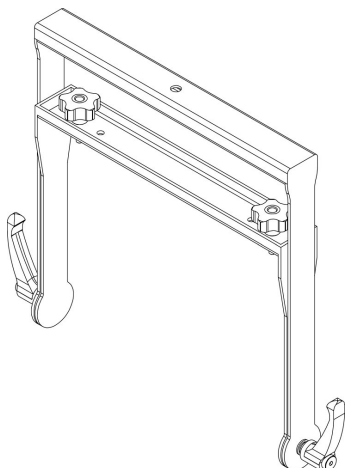
It is secured to the cabinet by means of M10 male locking knobs that screw into the side of the loudspeaker to mount it in a landscape format. A single 13mm diameter hole is provided for attachment in installation or via a hook clamp or similar.

The FC-P12h is designed to support one single ESP-12 loudspeaker.

Weight (including fixings) 5kg / 11lbs

FC-P12v

Vertical mounting cradle



The FC-P12v is a simple and effective means of mounting the ESP-12 in both temporary and permanent applications.

It is secured to the cabinet by means of M10 male locking knobs that screw into the top of the loudspeaker to mount it in a portrait format. A single 13mm diameter hole is provided at the top of the cradle for attachment either in installations or via a hook clamp or similar.

The FC-P12v is designed to support one single ESP-12 loudspeaker.

Weight (including fixings) 5kg / 11lbs

3.0 - 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.

Stand Mounting

When mounting loudspeakers on a stand, please take note of the following important considerations:

- Ensure your stand height is locked off and the tripod legs are positioned so as to be stable.
- Check the weight loading of your stands before attempting to mount the loudspeaker.
- Do not stack a second loudspeaker on top of the stand-mounted one.
- Ensure cables are run so as to leave enough slack to enable neat wiring, and thus reduce the risk of the speaker being pulled over. Loose cables should be covered or taped down wherever possible to reduce trip hazards.
- If stands are being used outdoors, it may be necessary to add ballast to the base of the stand to prevent it toppling over.
- When using poles on top of subwoofer systems, please observe similar precautions.

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.

To ensure the highest standards of safety, the following information on array assembly must be exactly followed and understood.

Only use EM Acoustics recommended rigging hardware and accessories, which are specifically designed for the purpose. Do not use these accessories for any other loudspeaker system - the components are specifically designed to work with this product and are not interchangeable with any other EM Acoustics loudspeaker product (unless where specifically stated) or any other loudspeaker system. The use of EM Acoustics accessories with other manufacturers' systems may compromise the safety standards and EM Acoustics is in no way liable for any loss, damage or injury caused by such practice.

Do not modify or alter the ESP-12 loudspeaker or accessories, nor use them in any way other than that described in this manual. Rigging components supplied with the ESP-12 are in no way interchangeable and should not be used as such.

The component parts of the ESP-12 and its accessories should only be assembled in the manner described in this manual, using the fasteners and fixings stated herein. The use of fasteners and methods of assembly not described in this manual may result in an unsafe assembly and as such EM Acoustics will not be responsible for any loss, damage or injury caused by such practice. Welding, drilling or any other means of modifying any part of the flying hardware or permanently fixing components to each other is strictly forbidden.

Rigging assemblies must only be assembled using the appropriate parts and fixings as described in this manual, explicitly following the assembly instructions given herein. Rigging components must only be fixed to the ESP-12 loudspeaker, using the correct cabinet location points, assembly methods and fasteners specifically described within this manual.

Walls, floors and ceilings must be capable of supporting the actual load placed upon them. The rigging hardware must be safely and securely fixed to both the loudspeaker system and the supporting structure.

Secondary Safeties

It is imperative that all loudspeakers flown in any given environment should be provided with a second, independent and properly rated safety suspension point in addition to the principle load bearing means of suspension. Steel wire ropes or steel chains of an approved construction and load rating only may be used as secondary safeties. Plastic covered steel chains may not be used as secondary safeties under any circumstances. Also ensure that all local and national laws are complied with when determining your primary and secondary suspension points.

Safety Inspections

Carefully inspect all flying system components prior to use for defects or signs of damage prior to installing or mounting your loudspeaker. If any components damaged or **you suspect them to be damaged, DO NOT USE THEM.**

Regular scheduled tests - which are much more rigorous than visual inspections - of all rigging components must also be carried out. Safety legislation, and test/inspection requirements, will vary from country to country and as such it is the user's responsibility to ensure that local regulations are adhered to. In most cases, annual independent tests & inspections carried out by a suitably approved and qualified inspector will be required.

EM Acoustics recommends detailed logbooks be kept of all inspections and load tests to ensure an accurate record is kept of the testing for each EM Acoustics rigging accessory.

When flying any loudspeaker system, always wear protective headwear, footwear and eye protection in accordance with local regulations.

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.

4.0 - Mains Power Requirements

4.1 - Power Supply

The ESP-12 utilises a Class-D amplifier module with a voltage-sensing power supply, ensuring universal mains voltage operation. The amplifier modules can safely operate with voltage ranges from 100 to 230VAC. **Important Note** – please be aware that using this product on 100-120VAC will draw more current from the mains supply than using at 200-230VAC.

4.2 - Combined AC input/loop output connector

The ESP-12 is supplied with a Neutrik PowerCON True1 combined inlet/outlet connector. This connector is rated at 16 amps and is locking to prevent accidental disconnection. Any additional loudspeakers connected to the female loop output connector also take their power from this primary input connector, and as such you must ensure the total load does not exceed 16 amps. The ESP-12 is supplied with a 3-metre mains power cable, fitted with a female PowerCON True1 NAC3FX connector at one end, and the other end stripped ready for you to fit your connector of choice.

4.3 - Loop output connectors

The ESP-12 is supplied with a loose NAC3MX connector for assembling your own loop output cables. Follow the instructions supplied with this connector to fit it to your cable of choice.

4.4 - Maximum Number of Looped Mains Connections

It is very important that the total current draw does not exceed 16 amps. Please remember that any loudspeaker connected in the chain will draw its power from the mains input connector on the first loudspeaker in the chain. Detailed below are the maximum recommended numbers of ESP-12 loudspeakers that can be connected at different voltage and supply current limits.

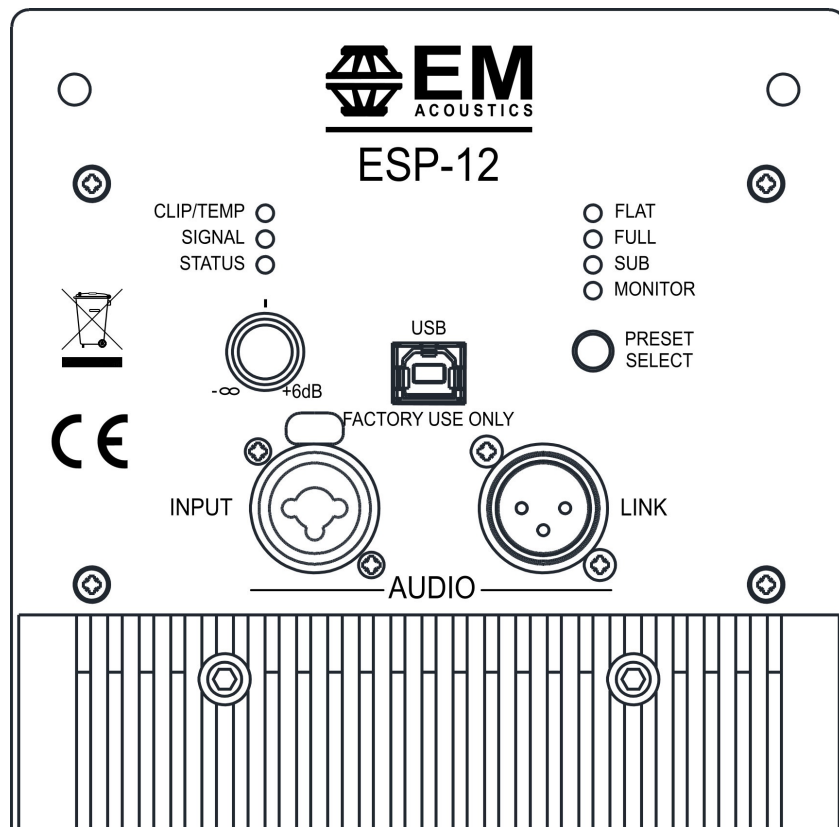
16-amp supply limit:

Product	115VAC	230VAC
ESP-12	1 looped (2 total)	3 looped (4 total)

4.5 - Powering up the ESP-12

When mains power is supplied, the power supply automatically detects the supply voltage and adjusts itself accordingly. The unit will perform a brief self-test before unmuting and being ready for operation.

5.0 - Connectors, Controls, Presets and Status LED's



5.1 - Connectors

The ESP-12 is supplied with a combined XLR/jack input connector, and a male XLR loop output connector. This loop output connector can be used to chain multiple loudspeakers together with the same signal, or to link subwoofers and fullrange cabinets in assembled systems.

The USB port on the rear panel is for factory use only.

5.2 - Controls

There are two controls available to the user on the ESP-12 - a simple attenuation control with a range of -INF to +6dB for system adjustment, and the Preset Select button. The Preset Select button allows the selection of the desired preset in the amplifier module (see section 5.3) and can also be used to put the ESP-12 into Auto Standby mode (see section 5.4).

5.3 - Preset Selection

There are four presets in the ESP-12:

FLAT: This is the standard mode, producing a flat response from the loudspeaker.

FULL: This is a mode for stand-alone use without subwoofers. A very gentle LF boost is applied for a more full-range response.

SUB: This is dedicated for use with the ESP-15S subwoofer - not only is the high pass filter raised to a higher frequency to integrate better with the subwoofer, but appropriate gain and delay are applied to time align the ESP-12 and ESP-15S together.

MONITOR: This preset should be used when the ESP-12 is being used on the floor as a compact stage monitor - producing a flat response despite the low frequency boost achieved by sitting the ESP-12 on the floor.

The active preset is shown by the green LED next to the preset name. To select a new preset, simply press the Preset Select button once and release it - the ESP-12 will mute, the LED will flash next to the preset being loaded, and then the system will unmute once the preset is loaded. Each press of the Preset Select button advances the preset by one.

The ESP-12 will power up in the same state it was in when it was powered down.

5.4 - Auto Standby Mode

By pressing and holding the Preset Select button for 3 seconds or more, the ESP-12 enters the power management mode - and the status LED turns cyan. In this mode, if no audio signal is detected for 15 minutes the DSP will enter low power mode and shut down the output stages of the amplifier to reduce heat build-up and power consumption. The ESP-12 will wake again on receiving an input signal greater than -45dB.

5.5 - Status LEDs

There are three LEDs on the rear of the ESP-12 to give information to the user, with the following functions:

5.5.1 - Clip/Temp LED

Lit **Yellow** High system temperature - the unit will activate the soft clip limiter to reduce output level

Lit **Red** Output signal clipping

5.5.2 - Signal LED

Lit **Green** Signal present

Lit **Yellow** Input signal engaging one of the output limiters

Lit **Red** Input signal too high - under 4dB margin from input stage clipping

5.5.3 - Status LED

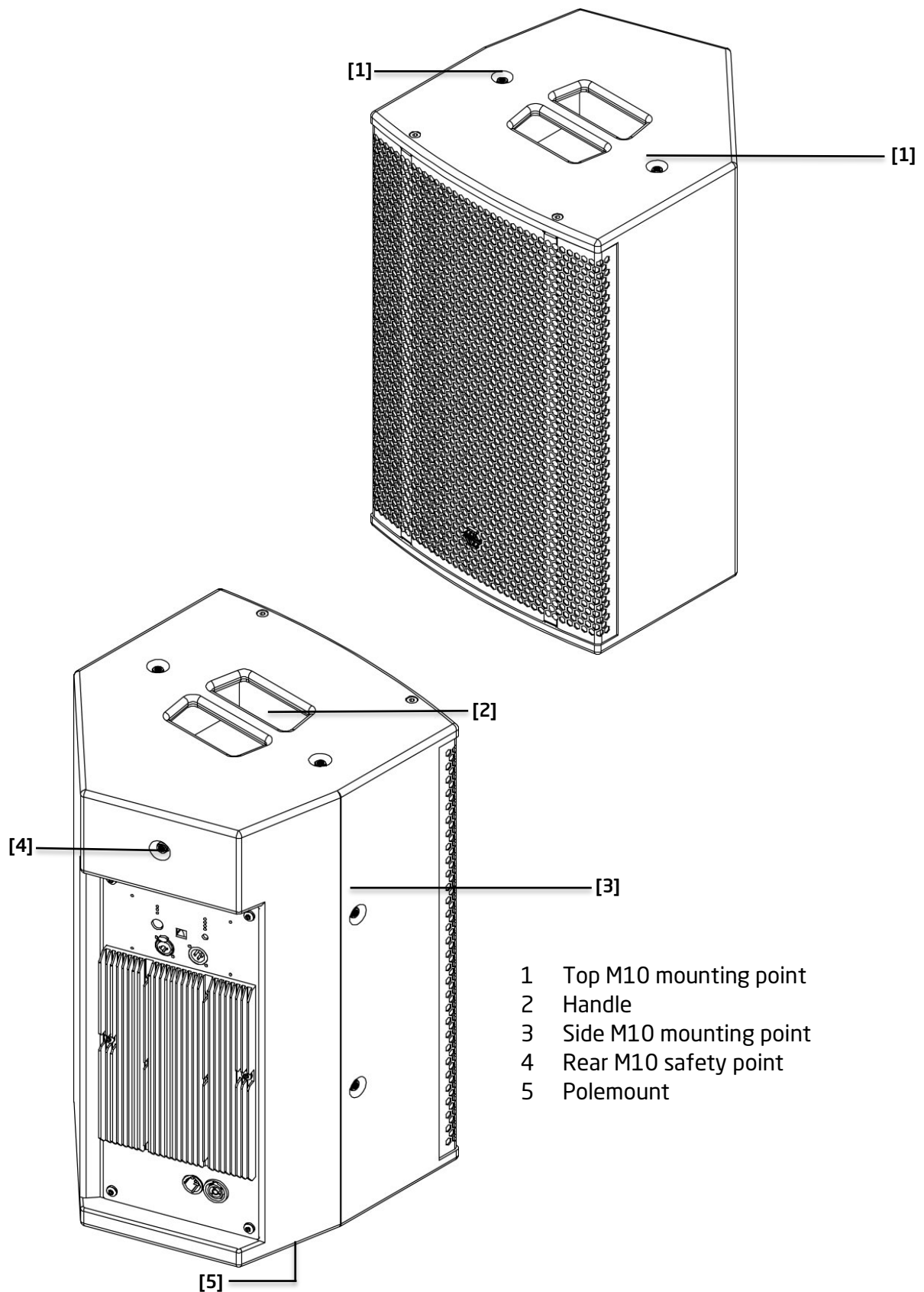
Lit **Green** System Active

Lit **Cyan** Auto Standby Mode enabled

Lit **Blue** System in Auto Standby - no signal detected in the last 15 minutes

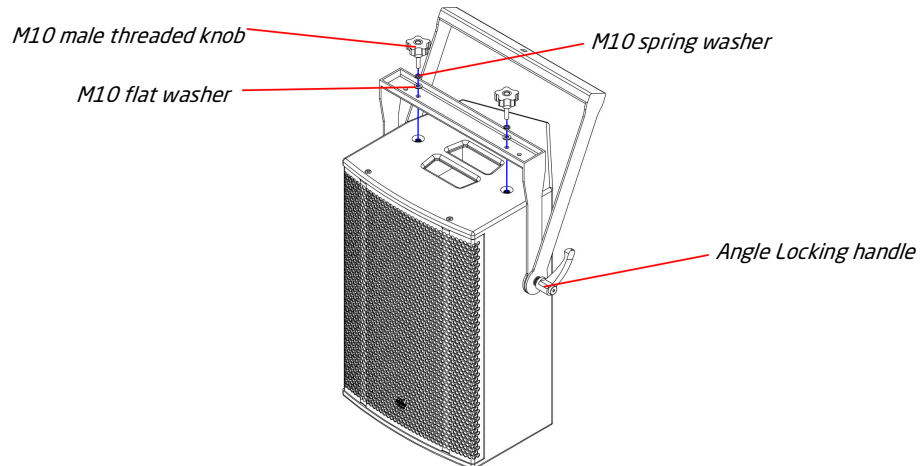
6.0 - Rigging & Mounting Options

6.1 - ESP-12 Cabinet Overview



6.2 - Using the FC-P12v

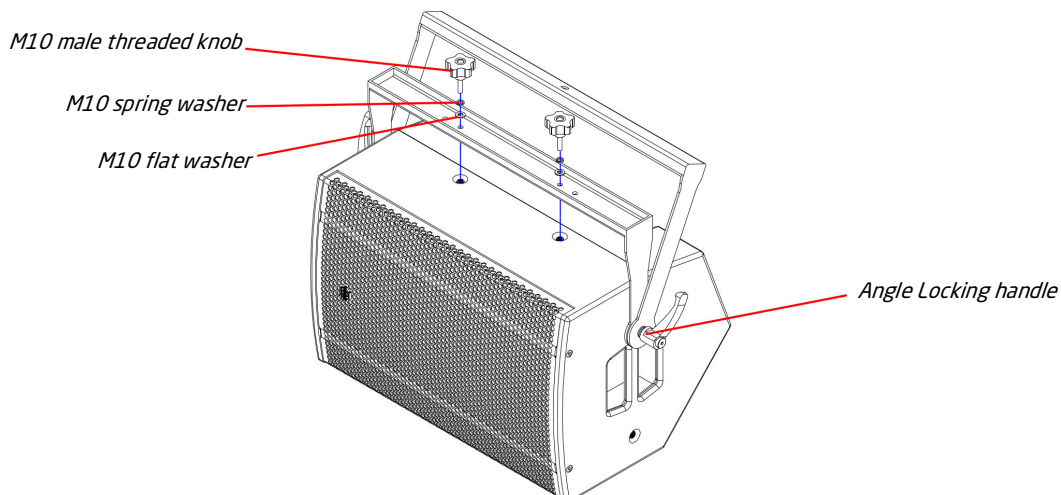
The FC-P12v is intended to mount the ESP-12 vertically - either using a hook clamp or similar from above, or a pole mount adapter to mount on a stand yet allowing enclosure tilt. The procedure for attaching the FC-P12v to the loudspeaker is the same regardless of the mounting orientation.



Loosen the locking knobs so that the outer yoke can be rotated relative to the inner yoke, which allows access to the mounting points. Remove the two M10 male threaded locking knobs from their storage location in the inner yoke, and line the inner yoke up with the mounting holes in the ESP-12. Secure the inner yoke to the ESP-12 by screwing these two knobs into the threaded points - ensure to use the washers as shown above. Once the inner yoke is tightly attached to the ESP-12, the enclosure can be lifted and the tilt angle can then be set with the locking handles.

6.3 - Using the FC-P12h

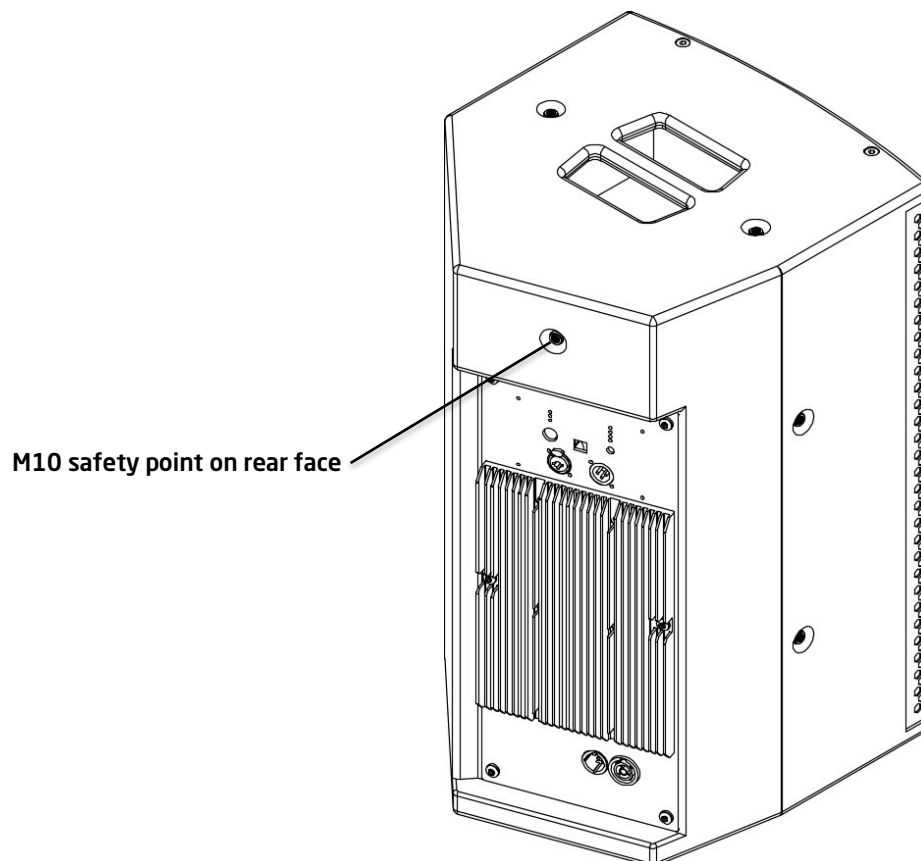
The FC-P12h is intended to mount the ESP-12 horizontally. To fit, lie the ESP-12 on its side. Remove the two M10 male threaded locking knobs from their storage location in the inner yoke, and line the inner yoke up with the mounting holes in the ESP-12. Secure the inner yoke to the ESP-12 by screwing these two knobs into the threaded points - ensure to use the washers as shown above. Once the inner yoke is tightly attached to the ESP-12, the enclosure can be lifted and the tilt angle can then be set with the locking knobs.



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

6.3 - Safety Point

Any flown loudspeaker must always have a secondary safety fitted. A single M10 threaded point is provided on the rear side face of the ESP-12. A simple M10 forged shoulder eyebolt can be screwed into this point. Safeties should always be arranged so that the loudspeaker cannot drop in the event of a primary attachment point failing.



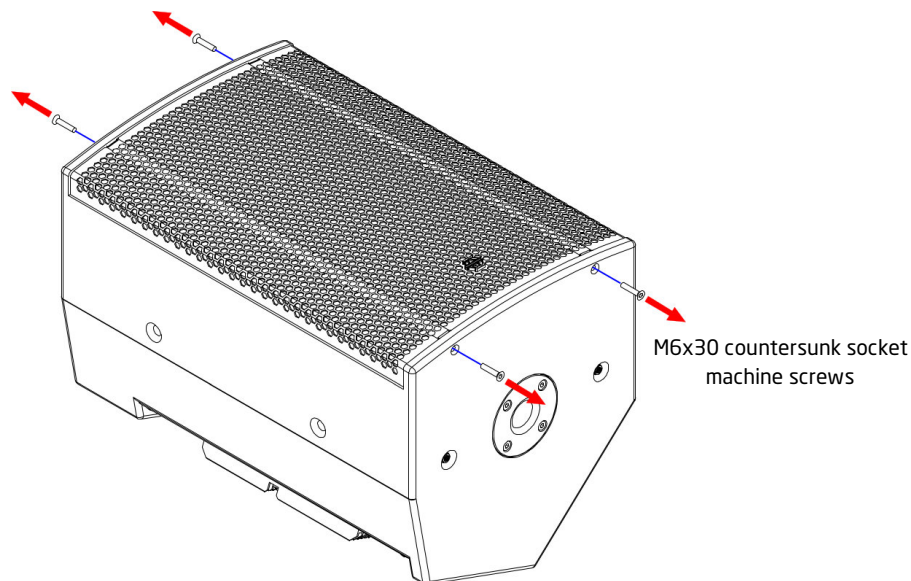
7.0 - Servicing Information

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

7.1 - ESP-12: Removing the grille

TOOLS REQUIRED: 4mm Allen key

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

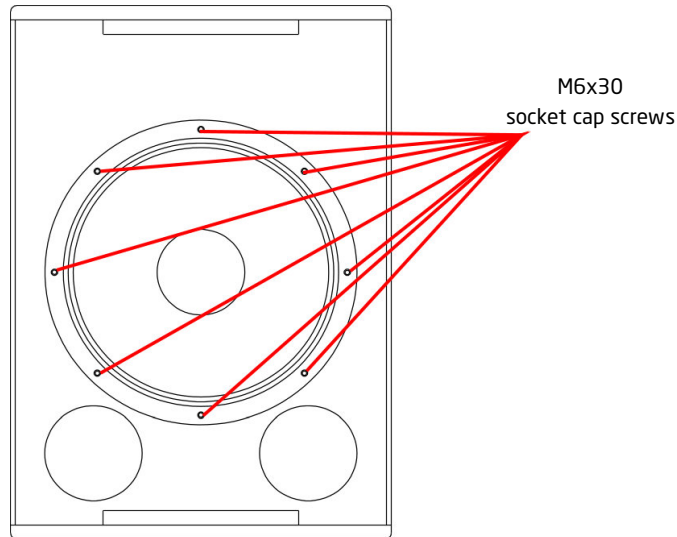


2. To replace the grille, position the grille on the front of the ESP-12 and ensure the threaded fittings on the grille are lined up with the mounting holes - gentle pressure may be required. Replace all of the M6x30 countersunk socket screws and ensure they are all started in their threads before beginning to tighten. Ensure they are all tightened evenly so that the grille sits straight and does not rattle. Be careful not to over-tighten as this will distort the grille.

7.2 - ESP-12: Removing the drive unit

TOOLS REQUIRED: 5mm Allen key

1. Complete step 7.1 above to remove the grille.
2. Using a 5mm Allen key, remove the eight M6x30 socket cap screws that secure the drive unit. Ensure that you collect the spring washers as well as the machine screws.



3. Lift the drive unit clear of the mounting hole and disconnect the cables - note the polarity for reconnection (brown to LF positive, blue to LF negative, white to HF positive, yellow to HF negative).
4. To replace the drive unit, ensure the 12" gasket is intact and complete - replace if necessary. Reconnect the cables to the drive unit (note the polarity detailed above) and then sit the drive unit into its mounting location, ensuring that the mounting holes line up.
5. Replace the M6x30 socket cap machine screws with their spring washers and flat 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. Be careful not to overtighten as this will distort the drive unit chassis.
6. Replace the grille as described above.

Appendix A - Technical Specifications

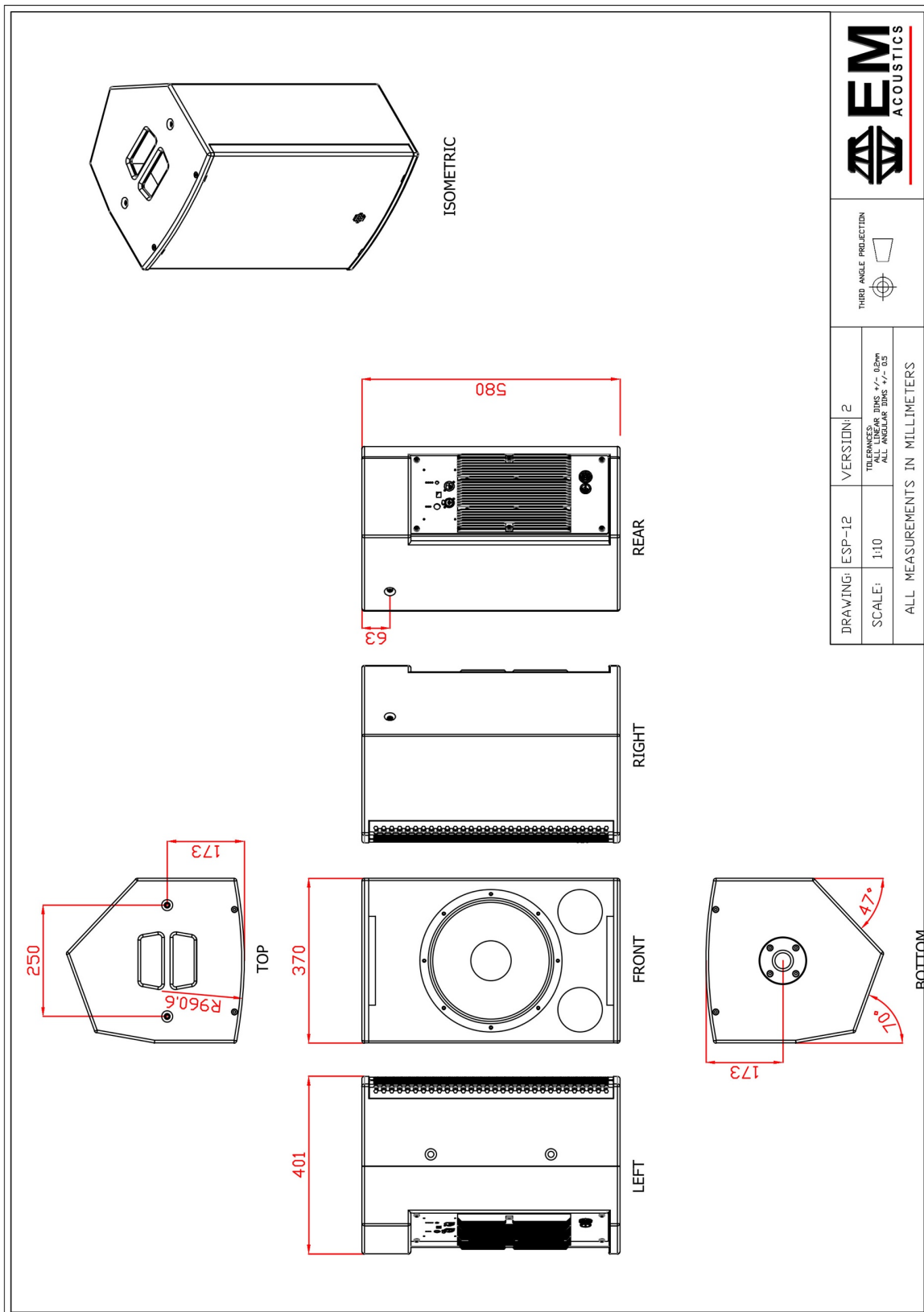
ESP-12 compact self-powered loudspeaker

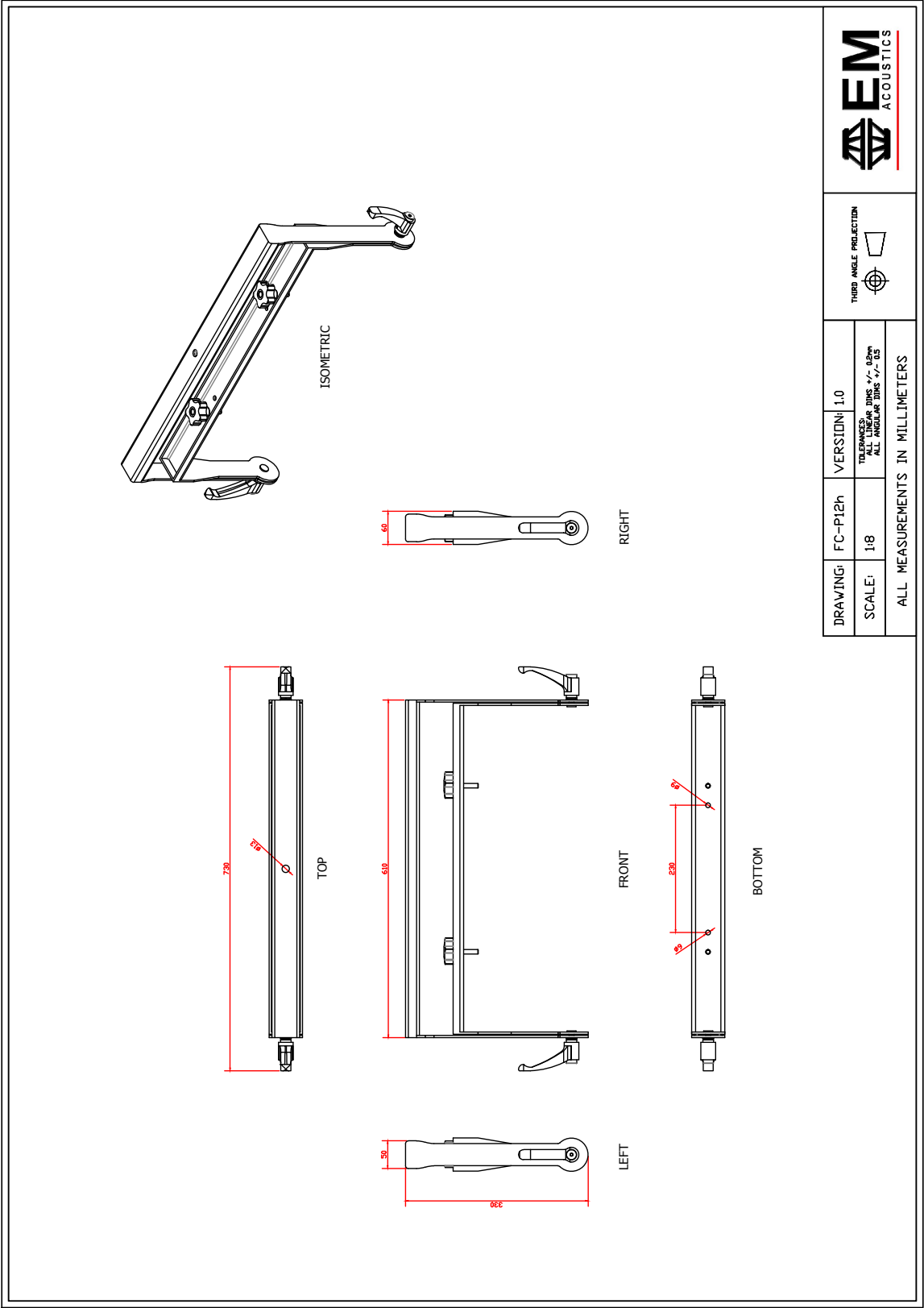
Dimensions (HxWxD):	560 x 390 x 401mm (22" x 15.4" x 15.8")
Net/Shipping Weight:	23kg/25.5kg (50.6/56.1lbs)
Frequency Response (+/- 3dB) ¹ :	60Hz - 20kHz
Dispersion ³ :	80° conical
Drive Units:	Coaxial 12" (305mm) LF/1.3" (33mm) HF drive unit
Maximum SPL:	125dB continuous, 131dB peak
Crossover:	Onboard DSP-based active
Enclosure:	15mm (5/8") multi-laminate birch plywood, rebated, screwed and glued. Finished in impact and weather-resistant polyurethane or white textured paint
Rigging & Hardware:	5 x M10 threaded rigging points. 35mm polemount 1 x flush bar handle
Grille:	Hex punched steel backed with acoustically transparent fabric
Options:	Colours
Amplifier Type:	Dual channel Class D
Amplifier Power:	800W LF, 400W HF (total power available)
DSP System:	24-bit 48kHz Analog Devices SigmaDSP
Cooling:	Passive heatsink, reserve internal fan
Connectors:	Neutrik Combi XLR/Jack input, male XLR output Powercon True1 mains inlet/link output
Operating Voltage	100-240V, 50-60Hz AC with PFC
Accessories:	FC-P12v vertical flying cradle FC-P12h horizontal flying cradle

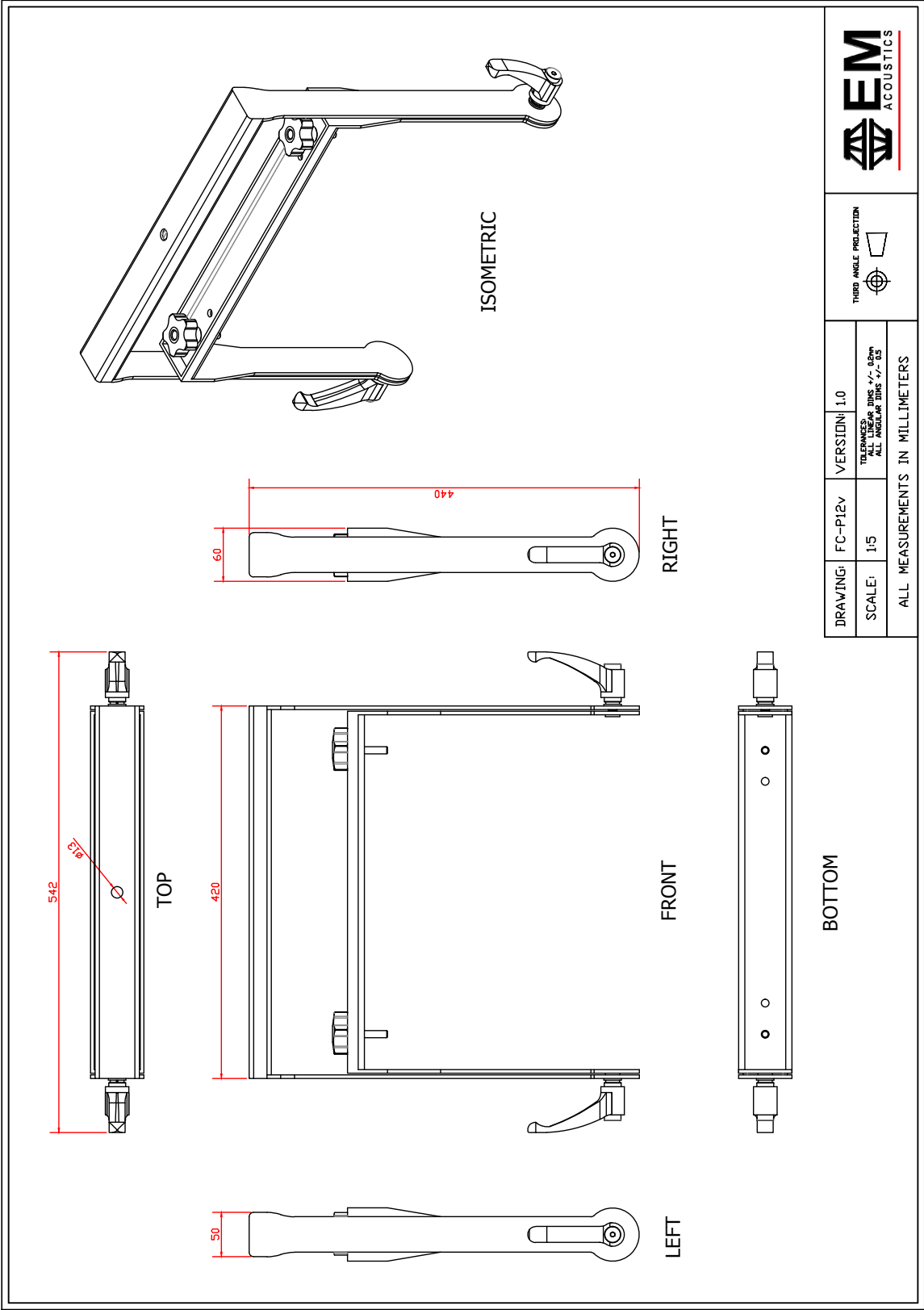
Notes on measurement conditions:

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
01A506	CAD-1203 replacement 12"/1.3" coaxial drive unit
04A042	RFG-ESP12 replacement grille/fabric for ESP-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.