



## PS Series

***PS8 - Analogue TDcontroller PS8 - PS8Amp - LS400***

***PS10 - Analogue TDcontroller PS10- PS10Amp - LS500***

***PS15 - PS15Bass - Analogue TDcontroller PS15 - LS1200***



***User Manual***

**Analogue TDcontroller Declaration of conformity**

This equipment has been tested and found to comply with the safety objectives and essential requirements of European (73/23/EEC and 89/336/EEC directives) and international Standards, by fulfilling the requirements of the following harmonized standards:

Electrical Safety (EU) : IEC 60065 (12/2001) Audio, video and similar electronic apparatus

Electrical Safety (US) : UL60065 Seventh Edition, dated June 30, 2003 category AZSQ, E241312.

Electrical Safety (CAN) : CSA-C22.2 N°60065:03 Edition, dated April 2003 category AZSQ7, E241312

Electrical Safety (Rest of the World) : CB test certificate DK-8371 based on IEC60065-2001 7nd ed. with all national deviations.

Radiated Emission (EU) : EN55103-1 (1996) Electromagnetic compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use.

Radiated Emission (US) : FFC part15 class B

Radiated Emission (CAN) : This Class B digital apparatus complies with Canadian ICES-003.

RF Immunity (EU) : EN55103-2 (1996) Electromagnetic compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use.

**Note:** EMC conformance testing is based on the use of recommended cable types. The use of other cable types may degrade EMC performances.



**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. (US market)
- 10) Protect the power cord from being walked on or pinched particularly at the apparatus, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

**Information about products that generate electrical noise :**





NOTE: The United States Federal Communications Commission (in 47 CFR 15.105) has specified that the following notice be brought to the attention of users of this product:

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 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 to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into 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.

The user may find the following booklet, prepared by the Federal Communications Commission, helpful: How to identify and Resolve Radio/TV Interference Problems. This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 004-000-00345-4. Use of a shielded cable is required to comply within Class B limits of Part 15 of FCC Rules. Pursuant to Part 15.21 of the FCC Rules, any changes or modifications to this equipment not expressly approved by NEXO S.A. may cause, harmful interference and void the FCC authorization to operate this equipment.

 The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.	 <div style="border: 1px solid black; padding: 2px; display: inline-block; text-align: center;"> <b>CAUTION</b>                      RISK OF ELECTRIC SHOCK                      DO NOT OPEN                 </div> 	 The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.
<b>WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.</b>		
To avoid electrical shock, do not remove covers. Dangerous voltages exist inside. Refer all servicing to qualified personnel only.		

**WARNING ! This appliance is a CLASS 1 apparatus and must be earthed.**



The green and yellow wire of the mains cord must always be connected to an installation safety earth or ground. The earth is essential for personal safety as well as the correct operation of the system, and is internally connected to all exposed metal surfaces. Additional recommendation for interconnection to other equipment can be found in the "Analogue TDcontroller Setting-Up Advice" section page 15.

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## INTRODUCTION

Thank you for selecting NEXO PS Series equipment. This manual will provide you with useful and important information about your PS speaker system:

PS8 & optional LS400 SubBass.

PS10 & optional LS500 SubBass.

PS15 & optional LS1200 SubBass and PS15Bass

The PS15 can be used in either passive or bi-amped mode (two-way active). This operation requires the NX242 Digital TDcontroller (see the corresponding user manual).

Earlier NEXO TDcontrollers for PS10 and PS15 are not reviewed in this manual. For information about those products please contact your NEXO dealer or consult our web site [www.nexo-sa.com](http://www.nexo-sa.com)

**Please devote some time reading this manual. A better understanding of some specific features of the PS series (like the asymmetrical directivity horn configuration) will help you to operate your system to its full potential.**



## LOUDSPEAKERS

### General Setup Instructions

#### Important notice concerning High Sound Pressure Levels

Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably in susceptibility to noise-induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time. The U.S. Government's Occupational and Health Administration (OSHA) has specified the following permissible noise level exposures: Sound Duration Per

Day In Hours	Sound Level dBA, Slow Response
8	90
6	92
4	65
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

According to OSHA, any exposure in excess of the above permissible limits could result in some hearing loss. Ear plugs or protectors to the ear canals or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss, if exposure is in excess of the limits as set forth above. To ensure against potentially dangerous exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels such as this amplification system be protected by hearing protectors while this unit is in operation.

#### TDcontroller use

Performance, sound quality and reliability of these speaker systems are entirely dependent on proper setup and use of the appropriate TDcontroller: We strongly recommend that all new users carefully read this manual with regard to the specific setup and use of the TDcontroller.

Analogue PS8 TDcontroller for PS8 systems (with or without LS400).

Analogue PS10 TDcontroller for PS10 systems (with or without LS500).

Analogue PS15 TDcontroller for PS15 systems (with or without LS1200).

NX242 Digital TDcontroller set on the appropriate set-up (See "NX242 User Manual")

These controllers are not interchangeable. Each one is precisely matched to the corresponding cabinets. Excepted NX242 that covers the entire NEXO range.

### PS15Bass use

The PS15Bass is a passive cabinet that uses the same signal as the PS15. It should therefore be connected in parallel with the PS15. You can use the same controller for both cabinets; both will be equally protected. If you are using the active mode of the PS15 the PS15Bass should be plugged into the LF channel of the PS15 (1+/1-); a short adapter will be required (wired from 1+/1- of the PS15 to 2+/2- of the PS15Bass).



### Speaker Wiring

The loudspeakers are connected with Speakon NL4FC plugs (not supplied). A wiring diagram is printed on the connection panel located on the back of each cabinet.

The 4 pins of the 2 Speakon sockets identified in / out are connected in parallel within the enclosure. Either connector can be used when connecting amplifiers and also to link to an additional PS cabinet and optional LSub (if present). This way, a single 4-conductor cable can connect the amplifier rack to 1 or 2 PS plus 1 LSub.



On the PS8, LS400, PS10, LS500, PS15 (used in passive mode), PS15 Bass and LS1200, the connectors are wired as follows:

Speakon Connector		Signal
Pin 1+	⇒	SubBass + (optional)
Pin 1-	⇒	SubBass - (optional)
Pin 2+	⇒	Main PS system +
Pin 2-	⇒	Main PS system -

An additional Speakon connector on the PS15 connection panel is identified as 2 WAY ACTIVE; it is reserved for operation in active mode (bi-amp, requires the NX242 Digital TDcontroller) and wired as follows:

Speakon Connector		Signal
Pin 1+	⇒	PS15 LF +
Pin 1-	⇒	PS15 LF -
Pin 2+	⇒	PS15 HF +
Pin 2-	⇒	PS15 HF -

Selecting a cable consists of calculating the correct cable section (size) in relation to the load impedance and the required cable length. Too small a cable section would increase its serial resistance; which would induce power-loss and response variations (damping factor).

The following table indicates, for 3 common sizes, a cable length with a maximum serial resistance equal to 4% of the load impedance (damping factor = 25).

Cable Section	Maximum Length	
	Impedance = 8 Ohms	Impedance = 4 Ohms
1,5 mm <sup>2</sup> [AWG # 14]	12 m [40 ft]	6 m [20 ft]
2,5 mm <sup>2</sup> [AWG #12]	20 m [64 ft]	10 m [32 ft]
4 mm <sup>2</sup> [AWG #10]	32 m [104 ft]	16 m [52 ft]

#### Initial Setup Precautions

When first powering up a system including brand new cabinets, NEXO recommends a gradual, minimum power ramp up period of one hour. This allows the loudspeaker components to stabilize during the very first hours of usage. This is particularly true for adhesives within the speakers' moving assemblies.

In all cases it is advisable to connect the loudspeakers only after all the other system components have been wired and are operating correctly. This is particularly important for amplifiers and the TDcontroller. It is good practice to turn down all the amplifiers' gains before connecting the cabinets and to turn them on again individually with a medium level music source fed into the system. The Sense LEDs of the

corresponding TDcontroller channel should light up accordingly. This will help to locate wiring errors, particularly Left to Right or LF to HF Sense line channel inversions which would disable the TDcontroller protection circuits and may invalidate the warranty.

## Asymmetrical Horn Configuration

### Principle

The Asymmetrical Dispersion Constant Directivity horn is an important feature of the PS Series. This concept was previously only available for highly specialized applications; in the general purpose PS it is fully exploited thanks to a practical design that makes user configuration of the horn practical and quick.

The proper configurations of the horn for two common applications are shown below. All 4 positions of the horn are possible and can be useful for specialized applications such as complex arrays, systems designed with CAD software and stage monitoring.

The specific dispersion of the PS8, PS10 & PS15 horn can be seen on figure 1 ("front of house" configuration):

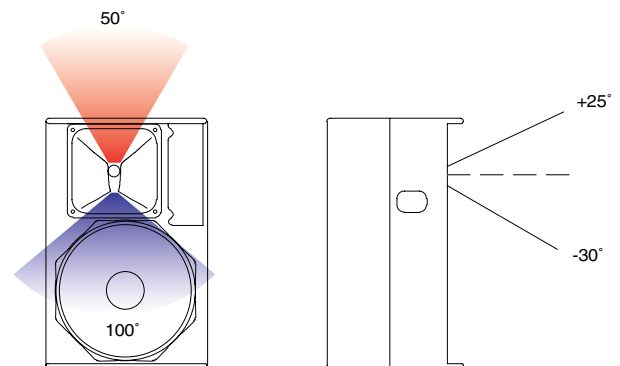
As seen on the side view, vertical coverage is narrower above horn axis (+25°) than below (-30°).

As seen on the front view, horizontal coverage is narrower above horn axis (50° Horizontal for +25° Vertical) and wider below (100° Horizontal for -30° Vertical). Between these two extremes horizontal coverage varies according to a specific law; on axis (0° Vertical) coverage is 75° Horizontal.

Access to the horn for configuration and checking is easily made by removing the front grille (pull gently the sides of the grille to disconnect the press-stud fixings). To modify horn orientation, remove the four Allen 4 metric or TORX TX25 screws (depending of model and age of the cabinet) that hold the horn in place. A sticker on the wide dispersion side of the horn shows the correct orientation for wedge monitoring and front of house applications: you simply position the indication on the desired side. The arrow indicates the wide dispersion.

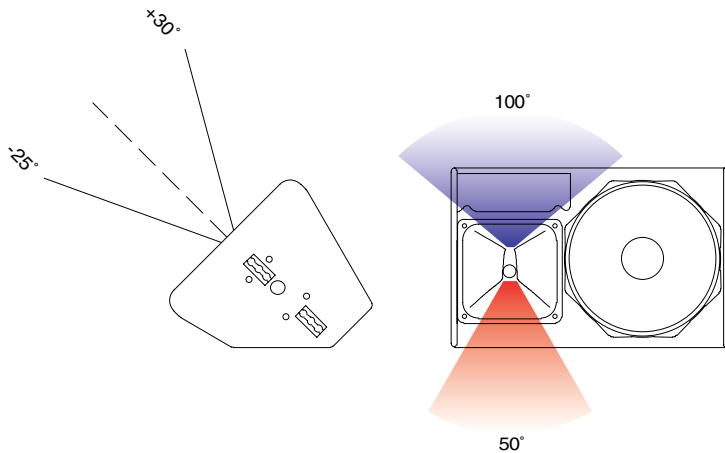
### « Front of house » Configuration

Good coverage of audiences often requires a conflicting combination of wide coverage ("short-throw") for the closest listeners (below cabinet axis) and narrow coverage ("long-throw") for distant areas (on or above axis). The PS Series horizontal horn coverage varies from "short-throw" to "long-throw" along the vertical axis to precisely match these practical requirements in a single system. For the majority of applications, the asymmetrical horn should be used with its "wide" dispersion side directed towards the floor (as shown by the arrow) but all four cabinet orientations are usable.





## « Stage Monitor » Configuration



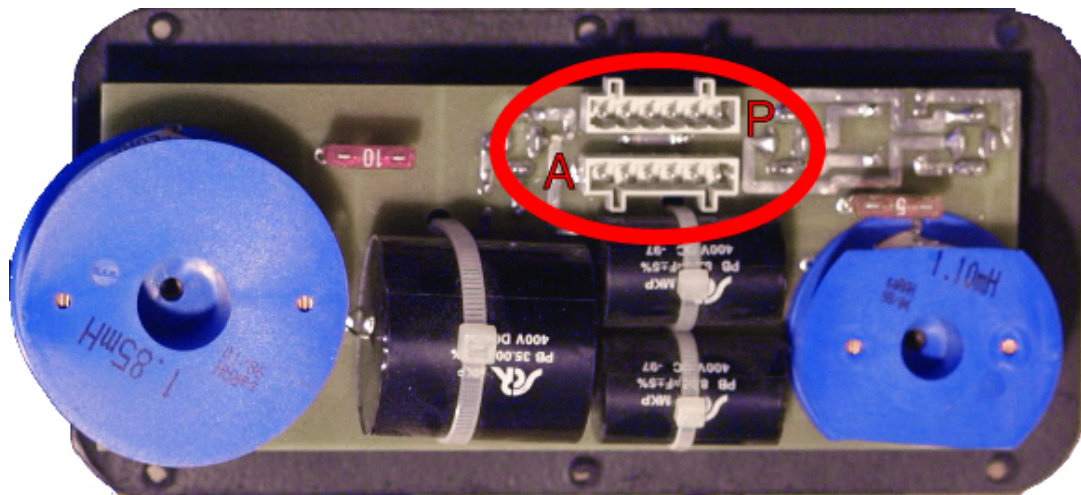
For stage monitors the required coverage is always wider when performers are close to the wedge (above the horn axis) than when they move away from it (below the horn axis). For floor monitor use the horn must be rotated with its "wide" dispersion side directed towards the top of the cabinet (as shown by the arrow) in wedge position as shown in the above figure. The specific dispersion pattern, the 2" driver and the very high power handling all contribute to the exceptional performance of the PS15 as a wedge monitor.

## Active / Passive configuration (PS15 Only)

Switching from passive (factory setting) to active requires the use of the NX242 Digital TDcontroller and modifications to the PS15 cabinet.

Unscrew the PS15connector plate at the rear of the cabinet (TORX 20 or Allen 2.5) and rotate the 6-pole connector through 180° from socket « P » to socket « A ». Replace the connector plate, taking care to remove the plastic blanking plug in the 2 WAY Active Speakon connector. It is strongly recommended to blank off the two PASSIVE Speakon connectors with blanking plugs to prevent any cabling errors at a later stage.

See also « Speaker Wiring » section page 6.



## SubBass Use (optional)



### General Recommendations

The SubBass section of the TDcontroller is monophonic (the Left and Right channels are summed at the input of the Controller). In a Stereo SubBass installation using 2 TDcontrollers, bear in mind that when only one Controller input is used, this will lower the gain of the Sub Output by -6 dB (as the nominal level is calculated for a 2 input use). You can either increase the gain setting of the LSub with the front panel level control or use a Y adapter to feed both inputs of the controller with the same signal. A switch inside the Analogue TDcontroller allows this setting to be made internally. (See “Sub jumper” page 21 )

For best results the LSubs should be positioned as close as possible to the PS loudspeakers and aligned with respect to the audience. This helps to avoid interference near the crossover point.

Although sometimes in conflict with the above recommendation, LSubs' low frequency performance is enhanced if multiple subs are grouped together. This also applies to Stereo installations using mono LSub output where left and right Subs can be grouped together in the center for best effect.

The nominal efficiency data for LS400, LS500 and LS1200 and the standard Sub level settings on the TDcontroller are for LSubs positioned on the floor (half-space). For other system configurations, and particularly for « flying » subs, the low frequency sound pressure can be -3 to -6 dB lower. This can be compensated for by a higher setting on the LSub output level control and/or by adding more SubBass units.

## Accessories

SAFETY recommendation for all accessories

Always inspect all components for damage before assembly. If you suspect that any of the components are defective DO NOT USE THE AFFECTED PARTS.

Carefully read the assembly instructions shipped with each accessory.

Secondary safety steels must be installed once the system has been flown to operating height. Secondary steels must be fitted irrespective of the local safety standards applicable to the territory.

When deploying the flying accessories, always wear protective headwear, footwear and eye protection.

Do not allow inexperienced persons to handle flying systems. Installation personnel should be

trained in loudspeaker flying techniques.

Ensure that motor hoists, hoist control systems and ancillary rigging components are currently certified as safe and that they pass a visual inspection prior to use.

Ensure that public and personnel are not allowed to pass beneath the system during the installation process. The work area should be isolated from public access.

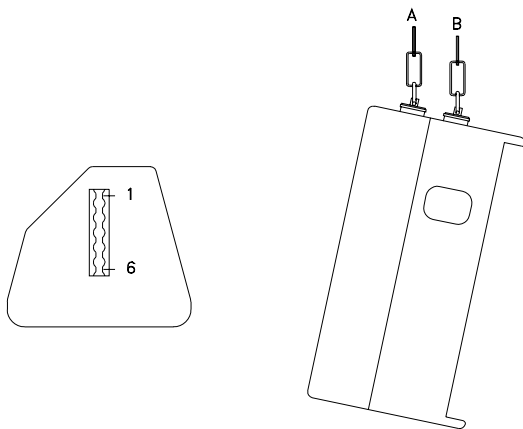
Never leave the system unattended during the installation process.

Avoid, when possible, flying cabinets over areas where the audience has access.

Stand, Mast & U Coupler

PS8, PS10 and PS15 have a built in 35 mm (1 3/8") diameter stand adapter. Cabinets can be positioned directly on a general-purpose speaker stand or on a mast inserted in the stand adapter fitted on top of the LS400, LS500 & LS1200. The U-Coupler accessory allows positioning and relative rotation of two cabinets arrayed side by side on top of the mast or on a speaker stand. The mast and U-coupler for the PS8 and PS10 are available as options. For safety reasons the use of this U-coupler with the PS15 cabinet is not recommended.

PS10 & PS15 Flying rails & Rings



PS10s and PS15s are equipped with steel anchor plates (standard) that can be fitted with the following fittings (optional):

Top: 6 position aircraft-flying rail. (9 for PS15)

Bottom: two single position round aircraft flying rails. (Two 3-position aircraft flying rails for PS15)

These rails are supplied as part of optional flying kits containing all necessary screws and 4 single stud aircraft flying rings. Heavy-duty double stud flying rings can be used in all rails except the bottom PS10 points. Installation requires a metric N°5 Allen key or TORX 30 (to remove the original back plate screws) and a metric N°4 Allen key/ TORX 30 to fit the rails.

Vertical orientation of cabinets is a function of ring position in the top rail. It is imperative for security reasons to use two rings per rail (left figure) linked to two independently fixed straps. Ring B will also be used to stabilize the cabinet rotation and reduce the angle given by the master ring A. Nominal vertical angles relative to the position of ring A (without the influence of ring B) are as follows:

Position	PS10 Angles	PS15 Angles
1	-17°	-20°
2	-12°	-16°
3	-7°	-12°
4	-2°	-8°
5	+3°	-4°
6	+8°	0°
7	NA	+4°
8	NA	+8°
9	NA	+12°

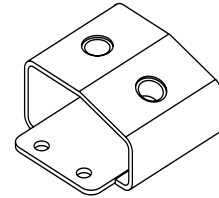
### Omnimount® style clamps

The back and the bottom of the PS10 is equipped with internal anchor points (M8 metric) to the Omnimount® 100 Series spacing standard. This is particularly convenient when cabinets must be installed permanently in a horizontal or vertical position. To remove the original screws an N°4 metric Allen key/TORX25 is required. Please note that the Omnimount 100 series is not rated for the weight of the PS15. Do not use this accessory with this cabinet without a second proper safety point.

### PS8 Accessories

#### FS0081-001

This accessory is designed to be mounted directly onto the PS8 cabinet surface. It provides 2 M10 captive nuts that allow the following accessories to be fitted: (not supplied in this kit)



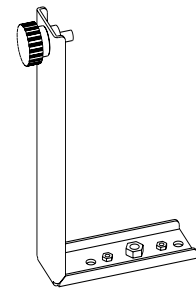
#### Standard lighting hook/CLAMP

#### M10 lifting eye bolt

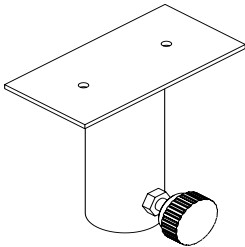
#### DIN Pivot (TV spigot)

#### FS0081-002

This accessory provides 2 welded M5 nuts and 1 welded M10 nut. (It should always be used along with the FS0081-001.) This adapter allows the cabinet to be fixed on the wall, ceiling or on a stand using the FS0081-003



#### FS0081-003



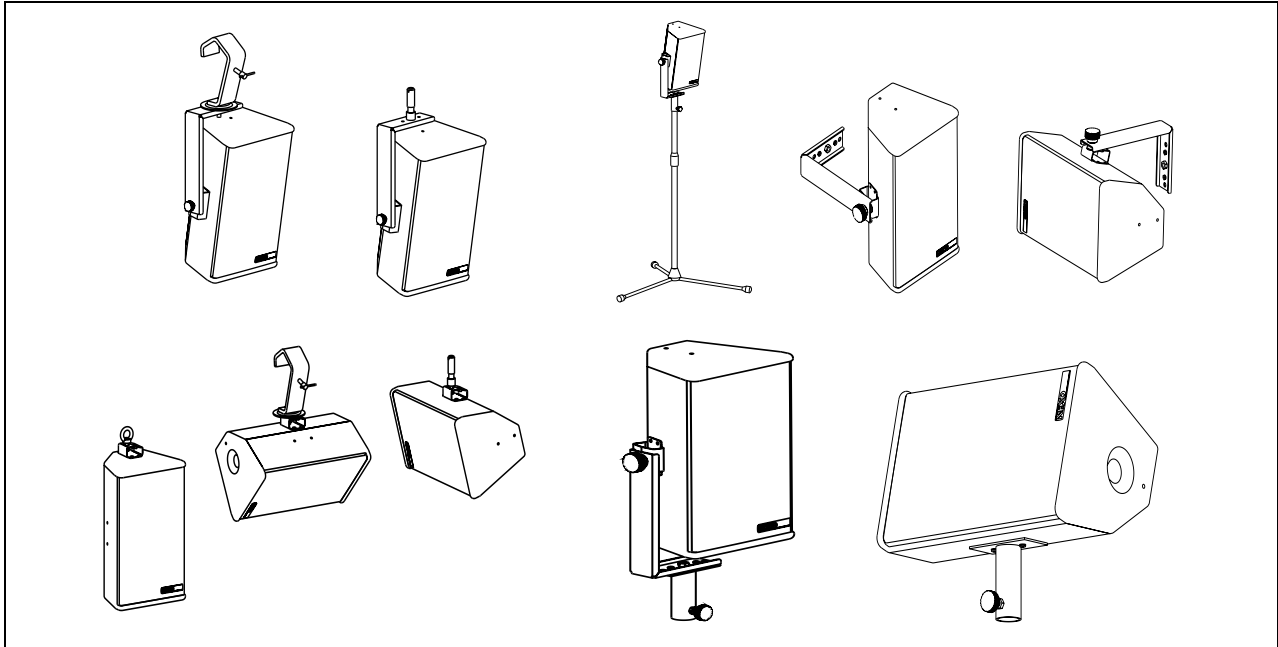
This adapter is designed for use with the PS8 cabinet. It allows for Horizontal mounting of the cabinet on a stand or a mast ( $\varnothing 35\text{mm}$ ). It can be used along with other accessories or it can be fitted directly to the cabinet.

#### SA0081-001

This safety accessory kit contains:

- 1 x 30cm steel sling (plastic covered) + 1 x speed nut & Bolt. Used to provide secondary safety for the front grille.

Fitting the safety wire is very simple and involves bolting it to the grille assembly and fixing the other end to one of the HF horn mounting bolts. Nexo recommend that this safety wire is always used when the PS8 cabinet is to be used in public areas above head height, for example when the cabinets are to be flown or wall mounted. It is the responsibility of the user to install the safety wire in all such situation.



## Use & Maintenance

### Checking the PS10 & PS15 internal fuses

The following paragraph concerns only the PS10 and PS15 cabinets, since the PS8 is fitted with a re-settable fuse that does not require maintenance.

The function of these fuses is to protect the passive crossover against overheating if a speaker component is accidentally disconnected or fails open circuit. They can also protect amplifiers from current overloading in such an event. To preserve sound quality the fuses are not inserted in series with the loudspeaker components themselves and thus do not protect them directly. If a loudspeaker component is accidentally disconnected or fails open circuit and needs repairing, the fuses must be checked. Their status can be verified visually and they are easy to replace.

Caution: a broken fuse will degrade sound quality and endanger the loudspeaker components but the cabinet will still operate. The order of the passive filter will be reduced; this will lead to an improper phase matching of the two drivers, and in the case of the HF driver to potentially dangerous excursion. It may not immediately be noticeable. Incidents that can cause fuse breakage require the cabinet to be opened; it is good practice to always check the fuses in such cases.

PS15: These fuses are of the common "automotive" type (ATO Blade type) with standard values (5A & 10A) on the passive crossover and 5x20 temporized fuse (T500mAL250V) on the ICN circuit.

PS10: These fuses are of the common "automotive" type (ATO Blade type) with standard values (3A & 10A)

The fuses are located as follows:

PS10 & PS15 On the PCB of the internal passive crossover located behind the connector panel. Release the 4 or 6 screws holding the connector panel (Allen metric 2.5 or TORX20) and disengage the panel & crossover assembly (an upward rotation movement is required).

PS15: On the ICN PCB located near the compression driver. Remove the HF horn; the PCB is located on the side and is fixed to the side of the cabinet.

### Troubleshooting

Simple troubleshooting does not require sophisticated measurement equipment and can be easily undertaken by users. The technique is to segment the problem by identifying the faulty system component: signal source, controller, amplifier, loudspeaker or cable? Most installations are multi-channel; it is often the case that one channel works and others do not. Trying different combinations of system elements can usually help to isolate and locate the fault.

Some cabinet faults can be quite easily located and corrected by the user. A simple sweep with a sine wave generator can be very helpful but it MUST be made at a fairly low level to prevent damage to the speakers: A sine wave sweep can help find:

- Vibrations due to loose screws.
- Air-leak noises: check that no screws are missing, particularly where the accessories attach to the cabinet.
- Vibrations due to a front grille badly positioned on the quick release fixings.

Some faults require opening the cabinet:

- Fuses (refer to above paragraph)
- Foreign object that has fallen into the cabinet after repair or through the ports.
- Internal connection wires or absorbing material touching the loudspeaker diaphragm: check by removing the bass loudspeaker (Allen metric N°4).
- Loudspeaker not connected or phase reversed following a previous inspection, test or repair.

### Maintenance & Warranty

Nexo loudspeakers and electronics are covered against defects in workmanship or materials for a period of two (2) years from the original date of purchase. At the discretion of Nexo, the defective item will be repaired / replaced with no charge for materials / labor. The item to be repaired must be adequately packaged and dispatched, prepaid, to an authorized Nexo distributor / service center. Repair by other distributors / service centers or personnel not authorized by Nexo shall void the warranty. This Nexo warranty does not cover cosmetics or finish. It does not apply to any items that have failed due to user abuse, accidents, modifications or any type of misuse.

## Analogue TDcontroller Setting-Up Advice

### Mains Power



**WARNING ! THIS APPLIANCE MUST BE EARTHED.**

The green and yellow wire of the mains cord must always be connected to an installation safety earth or ground. The earth is essential for personal safety as well as the correct installation of the system, and is internally connected to all exposed metal surfaces. Any rack framework into which this unit may be mounted is assumed to be connected to the same grounding circuit. (see also p.15)

NEXO TDcontrollers don't provide a mean to switch off the unit from the front panel. As they are intended to be rack mounted the back panel is not accessible during use. Therefore it is left to the user to provide a disconnection mean readily operable.

### Voltage setting

NEXO TDcontrollers use a switch mode power supply (SMPS). This SMPS accepts universal AC power input voltages in the range 90V to 264V, and requires no manual adjustment for voltages in this range.

### Mounting the TDcontroller in a rack (Grounding, shielding & safety issues)

The TDcontroller is intended for rack mounting. The only accessible part during use shall be the front panel of the TDcontroller. Any space above or under the TDcontroller shall be obstructed with a blank panel.

The rack is a free grounding and shielding structure and it provides extra shielding. Therefore, it is desirable that the screws used to fix the TDcontroller in the frame or rack provide an electrical contact between the chassis of the TDcontroller and the rack.

The primary reason for grounding is safety. Conformance to the applicable requirements of the authorities having jurisdiction is, of course, mandatory. However, grounding also has an impact on electromagnetic compatibility. From the EMC point of view, it is desirable to have a low impedance ground network, as a current flowing in the ground network will then produce low voltage in the network. A low impedance network can be obtained using a multipoint ground scheme, with as many closed ground loops as is economically possible.

### Fuse



The fuse provided in the unit will not blow during normal operation. If the fuse blows the TDcontroller has malfunctioned. This fuse must only be changed by NEXO certified service personnel. In any case do not replace the fuse with a non-certified NEXO fuse, as this will invalidate the NEXO warranty.

### CAUTION!

This servicing instruction is for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

### Recommendations for wiring the sense lines

The impedance of the sense inputs of the TDcontroller are high, so currents are low and therefore light duty cable can be used. If the TDcontroller is housed in the amplifier racks an unshielded cable may be used.

If the TDcontroller is located remotely - at the mixing position - a shielded cable is recommended, without using the shield as a conductor. The cable must be well protected from public access, as it carries potentially dangerous amplifier voltage.

When one of the channels is not being used and the corresponding sense line is disconnected, cross talk onto the inactive sense line may in some cases produce signals capable of causing the inadvertent illumination of the Sense LED on that channel; although this has no effect on the internal operation of the TDcontroller, it can be cured by short-circuiting the terminals of the inactive sense line.

### Recommendations for wiring the audio outputs

The output stages can drive several amplifiers in parallel; however it is not advisable to work with loads of less than 1kOhm (and strictly forbidden to drive less than 600Ohms). It is best to check the impedance characteristics of the amplifier inputs - supplied by the manufacturer - to check how many amplifier channels can be paralleled. Where precise information is not available (and taking 10kOhm as the minimum value possible), ten channels in parallel per output is a sensible maximum.

### Electromagnetic environments

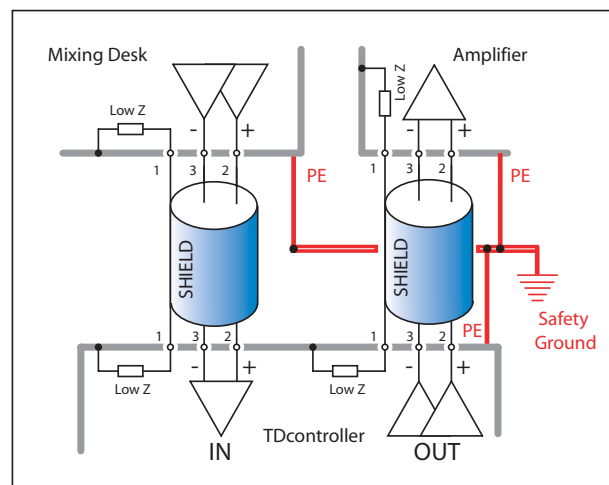
The emission (this word describes all types of electromagnetic noise radiated by the equipment) requirements which have been applied to Nexo's TDcontrollers are the stringent requirements of the "Commercial and light industrial environment" of the product family EMC standard for emission.

The immunity (this word describes the ability to cope with electromagnetic disturbance generated by other items and natural phenomena) requirements that we have considered exceed those applicable to the "Commercial and light industrial environment" of the product family EMC standard for immunity. In order to provide a further safety margin, we recommend that you do not operate the TDcontrollers in the presence of electromagnetic interference exceeding half of the limits found in this standard.

These two EMC standards are those applicable to pro-audio equipment for the implementation of the "EMC directive".

### Analogue signal cables

Analogue signals should be connected to the input and output ports of the TDcontroller via shielded twisted pair or starquad cable fitted with XLR connectors on the TDcontroller side. We recommend the use of low transfer impedance cables with a braided shield and a transfer impedance below 10 mΩ/m. For the sense inputs, the noise requirements are not as stringent, and





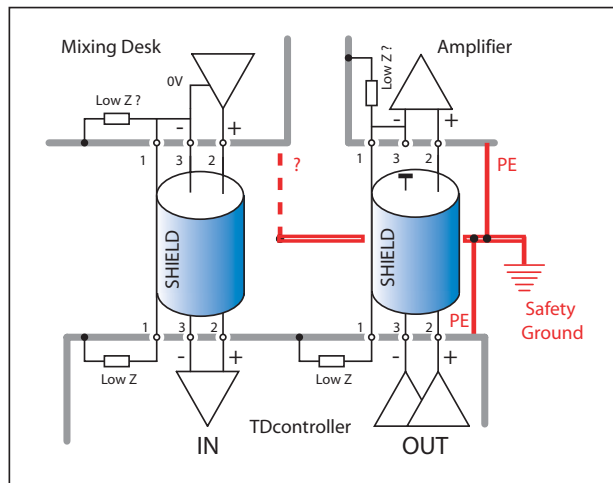
any kind of twisted pair cable will be adequate.

The TDcontroller is intended to be used with symmetrical (balanced) sources (for instance a mixer) and symmetrical loads (for instance a power amplifier (see figure)). You can see that the TDcontroller provides a low impedance path between pin 1 of its XLR connectors and its chassis. The TDcontroller can sustain high current in pin 1 without degradation of output noise. We recommend that the sources and loads you use have the same desirable characteristics.

It is sometimes claimed that connecting cable shield at both ends creates ground loops, and that the current flowing in such loops will produce noise. This is not the case for most professional audio equipment. In short, there are two kinds of loops in which voltages are present: the loops formed by signal wires, and the loops formed by grounded conductors, among which are protective earth conductors (PE) and signal cable shields.

When a cable shield is grounded at both ends, a loop is closed, and the resulting current causes a reduction of the voltage induced on signal lines. This effect is what the cable shield is intended to produce, since this is how it protects your signal from magnetic fields.

If you are using an asymmetrical (unbalanced) source, it is best to use a shielded twisted pair and to connect wire 3 of the cable to the shield at the source output end (see figure). This technique prevents noise currents flowing on the return path of the signal. If you are using an amplifier with an asymmetrical (unbalanced) input, it is best to use a shielded twisted pair, and to connect wire 3 at the TDcontroller end only, as shown in Fig. 2. This keeps a good capacitance balance for the signal, however noise currents flow on the return path of the signal. (Note that this is only acceptable for a short cable).



If you are using a symmetrical (balanced) source or amplifier which is prone to become noisy when a current of less than 100 mA at the mains frequency (50 Hz or 60 Hz) is sourced into pin 1 of its XLR connectors, you might consider opening the ground loops.

## Analogue TDcontroller USER GUIDE



### Read before use

Each Analogue TDcontroller is designed to be used with its proper set of speaker cabinet (PS8 / LS400, PS10 / LS500; PS15 / LS1200). They are not interchangeable. Its main functions are:

- To optimize the response of the system
- When operating with the LS SubBass system (optional), splitting the stereo (2 channel) signal into 2 frequency bands (PS main system and LS SubBass system)
- Active protection of the cabinets by dynamic audio signal processing (Temperature and Displacement servo control)
- Reduction of amplifier overload (Peak limiter function)

Analogue TDcontrollers also feature:

- Stereo operation (2 independent channels) for the main system
- Global switchable output level
- Adjustable level on the SubBass channel
- High CMRR input stage and High current drive output
- Compensation of power compression effects on the system response curve.

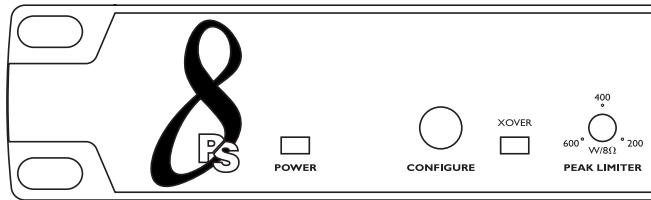
The Analogue TDcontroller is designed to be inserted between the Audio source (console, preamplifier, etc.) and the power amplifier.

### Front Panel

Most front panel functions and indicators are located inside 2 distinct windows: left-hand areas relate to functions and indicators dedicated to the optional Sub-bass section, while right-hand window contains indicators concerning servo control operation for the PS cabinets.

For more technical details about servo control operation and internal electronic processing, please refer to section "TDcontroller REFERENCE GUIDE." Page 22.

Turning the LS channel Overlap / Crossover

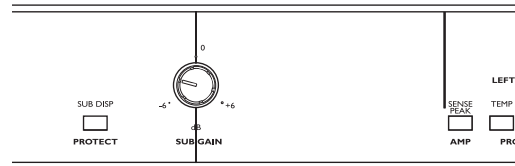


Pushing the CONFIGURE button modifies the high pass filtering. It does not affect the sub output, which will always be a filtered sub signal. (This is therefore not a Sub on/off button). In the « Overlap » position, the PS is exploited to its maximum capability.

This position should be used if the system is being used without a LSub. It can also be used with the LSub; In this case, there will be a boost in the crossover area. The « Cross over » position is generally recommended when using the LS400.

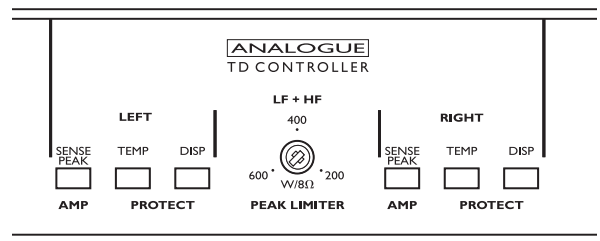
Adjusting the LSub level (Sub Level)

The potentiometer adjusts the level of the LSub channel, a range of 12 dB allows a variety of configurations and application conditions to be accommodated. Center position of the knob is calibrated for 1 LSub used with 2 distant PS.



Amplifier & Protection indicator

The bicolor green/red AMP LED indicates signal presence at the sense input of the concerned channel, allowing visual confirmation of the return connection of the Sense cables from the amplifier output. The LED is flashing red, when the Peak limiter is acting, reducing excessive peak voltage or levels capable of overloading the channel amplifier.



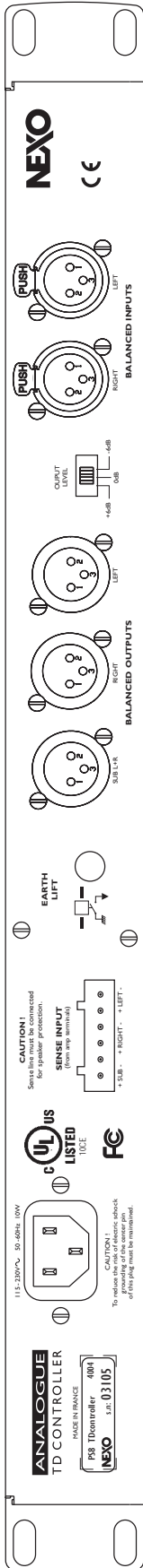
The yellow VLF LED indicates that displacement protection for the LSub are engaged on the SubBass channel. The temperature protection is not monitored.

On each side of the PS main system window, yellow TEMP and DISP LEDs indicate when protection has been activated (temperature or displacement control) for the LF (the HF drivers temperature protection is not monitored).

Peak Limiter adjustments

The Analogue TDcontroller features two independent peak limiter trims (one for the LSub amplifier section, one for the PS amplifier section), which allows the peak limiter to be set to limit the maximum power of the amp (without affecting the protections threshold). The peak limiter has no real cabinet protection functions; it must be tuned to avoid overdriving the amp that in turn can generate obvious clipping noise.

To set the peak limiter to the correct value, either turn the trimmer clockwise until the red LED lights at the same time as the amp's clipping LED, or use the graduation (power value given for 8 load).



Rear Panel

Audio Inputs

The audio inputs are two 3-pin female XLR connectors located in the area labeled BALANCED INPUTS. Signal is applied between pins 2 and 3, pin 1 is connected to ground. When the Controller is linked to a signal source with balanced outputs, the XLR connections are simply wired pin to pin (1 to 1, etc.). As a result of the balanced nature of the outputs (and providing that balancing is respected by way of the connection to the amplifier), there is no hot or cold pin - the Analogue TDcontroller being neutral regarding the polarity of the signal.

Output Level Switch

The 3-position output level switch is used to match the processor gain to the amplifier gain for optimum signal to noise ratio. The three gain values available are +6, 0 or -6 dB. For minimum noise floor the -6dB setting should be chosen, for maximum headroom the +6dB position should be used.

Audio Outputs

The audio outputs are the three 3-pin male XLRs located in the area labeled BALANCED OUTPUTS. The channel corresponding to each output connector is identified by the labels Left, Right and Sub L+R (mono SubBass).

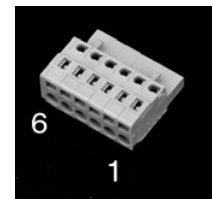
Signal is applied between pins 2 and 3, pin 1 is connected to ground.

When used with an amplifier with balanced inputs, the wiring of the output XLR is simply pin to pin (1 to 1, etc.), the polarity of the signal being preserved if the source connected to the input is also balanced (see previous section).

Sense inputs

The sense inputs of the three channels (left, right and SUB) are arranged on a six-pole barrier strip set into the rear panel within the area labeled SENSE INPUT. The Sense inputs are intended for connection to the output signals of the amplifiers driving one cabinet of each the channels being used.

Connection is made via the female part - removable - of the connector (supplied with the Controller) as outlined below:

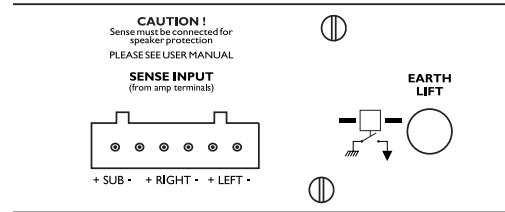


Channel	Amplifier Output Terminal	Barrier strip connector
PS Left	- (black)	pin 1 (figure)
	+ (red)	pin 2
PS Right	- (black)	pin 3
	+ (red)	pin 4
LS	- (black)	pin 5
	+ (red)	pin 6

Input sense connection **MANDATORY** for proper operation of the servo-control system, the cabinets will NOT BE PROTECTED if the sense lines are unconnected.

Earth Lift

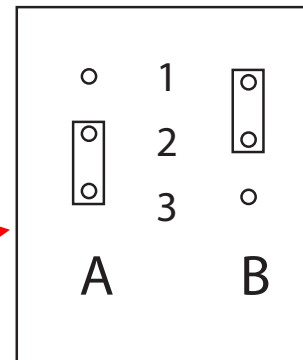
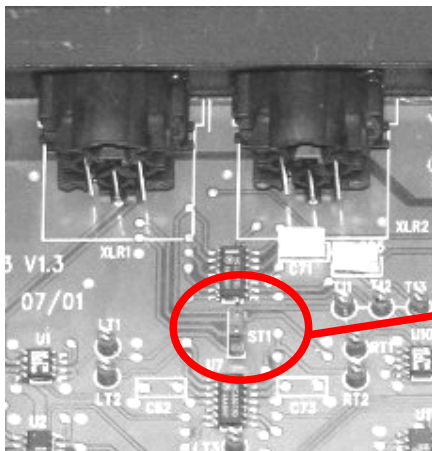
The push button labeled « Earth Lift » allows connection (depressed position), or disconnection (out position) between the signal ground and the mains earth, which is itself linked to the chassis. Using this button may help to eliminate hum due to ground loops created in the system.



Sub jumper

In certain applications you may wish to disable the mono summation (but keep the 6dB gain boost) on the sub channel. By moving the internal jumper ST1 inside the unit, the sub channel will only use the Right input (with 6dB gain to keep the same sub level when the mono summation is enabled).

Always ensure that your TDcontroller is disconnected from main before opening the unit. Remove the 3 screws fastening the top panel. The ST1 jumper is located near the Input XLR. The PIN1 being the PIN closest of the Input XLR. Strap PIN 1-2 (B in the drawing) in order to drive the sub only from input R. Strapping Pin 2-3 (labeled A, factory default) will provide the summation of channel R&L.



## TDcontroller REFERENCE GUIDE

### Linear section

The characteristics of the linear section are independent of signal level, as opposed to the servo control functions described in next paragraph.

#### Subsonic and VHF filtering

Low and high-pass filters are used to remove signals out of the usable frequency range, eliminating sub- and ultra-sonic components that could possibly degrade the performance of the Controller and amplifiers. These filters are optimized to realize the overall target system response.

#### Equalizing acoustical response

This equalization section provides the required correction to obtain a flat system response, as the cabinets are acoustically designed for maximum efficiency in the whole frequency range. Active rather than passive attenuation allows amplifier voltages to be lowering for a given output SPL and therefore increases the maximum SPL achievable with the same amplifier.

Active equalization also extends system bandpass, especially at low frequencies where acoustical performance is limited by cabinet size.

#### PS / LSub Cross-Over

From input signals summed together, the resulting mono signal is low-pass filtered to feed the SubBass channel. When the channel is turned on (LSub On), main channels (Left & Right) high-pass filters are reconfigured to filter out signal components below the crossover frequency. Slopes and other filter characteristics are optimized using techniques optimized for the actual acoustical data of each driver.

### Servo Control section

Servo control of the PS TDcontroller is intended to work with amplifier return signals present at the Sense inputs (monitored by front panel LEDs).

#### VCA's and VCEQ's

Each of the 3 Audio channels (Left, Right and SubBass) contains two voltage controlled elements driven by servo signals:

One operates on the whole frequency range (wide band VCA).

The other elements work selectively as dynamic equalizers (LF-VCEQ & HF-VCEQ).

Depending on the nature and origin of the servo signals, either one or the 3 combined elements is used to process the Audio signal. This feature allows more efficient processing while reducing audible effects.

### Displacement control

The signal from the sense input is fed through a shaping filter producing a signal proportional to the voice coil displacement. This control signal is compared to a fixed value and if exceeded, the LF-VCEQ is activated with very short attack time to reduce speaker excursion.

### Temperature control

Sense input is fed to a shaping filter to create a voltage proportional to the instantaneous voice-coil current. The signal is integrated over time to simulate heat buildup in the specific driver. When the resulting voltage exceeds a preset threshold, the VCA is activated to limit the voice coil temperature within its safety range. Power compression is also simulated by lowering the high frequencies when temperature protection is acting on the bass loudspeaker.

### Dynamic control

To reduce audible « pumping » effects due to very long time constants of temperature detection signals, an alternate integration is also processed with a shorter time constant. Whilst anticipating the temperature protection and reducing its unwanted effects, action of this signal also improves dynamics control.

### Peak Limiter

The above mentioned devices provide reliable protection against potential speaker over-heating and over-excursion. Nevertheless driving the cabinets at very high peak voltages (with oversized amplifiers) as well as delivering distorted signals might be dangerous for the speakers. The Peak limiter is both useful for:

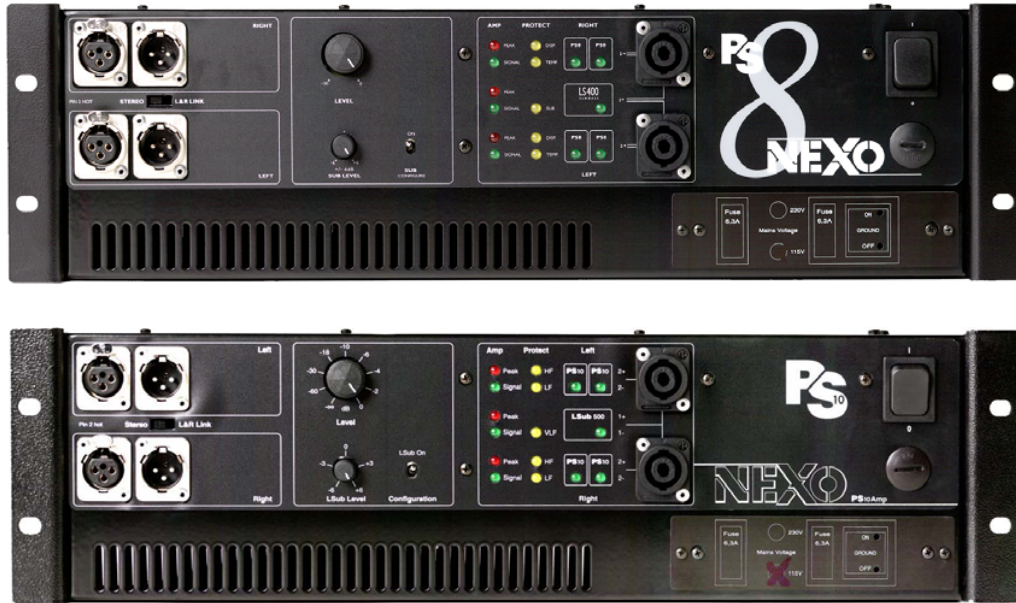
Maintaining good sound quality at high levels (it will reduce amplifier distortion).

Increasing protection reliability (limiting peak voltages to levels that speakers can permanently withstand, and reducing the occurrence of subsonic signals delivered by overloaded amps)

## AMPLIFIERS

### PS8Amp & PS10Amp

Please note that this equipment is not UL approved and therefore not sold on the US market.



The PS8Amp and PS10Amp are power amplifiers tailored for PS8 and PS10 system and their respective LS400 & LS500 sub bass requirements. Their structure and power being identical, they share the same specifications:

Total integration of a TDcontroller (with internal sense connection) which specifications are identical of those of an independent TDcontroller described in the chapter "TDcontroller REFERENCE GUIDE" page 22

2 or 3 channel instantaneous configuration via front-panel switch, allowing a 3-WAY use with the appropriate sub bass or a 2 WAY (wideband) configuration. Power delivered by the amplifier is thus optimized for the proper configuration. Speaker wiring of each cabinet is also automatically re-assigned.

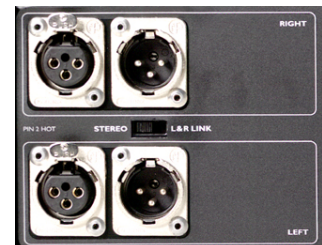
All connections and controls located on the front panel including mains fuses and voltage selection.

Super silent, back to front, variable speed fan cooling.

3 units high.

Inputs

Each balanced Line Input has a chaining male connector for operation of multiple PSAmPs. The L&R link switch simplifies Mono wiring when independent PSAMP stacks are used for stage Left and Right.





## Outputs

The two Speakon connectors are automatically configured with a visual indication of the current wiring. Configuration can be made while the system is operating.

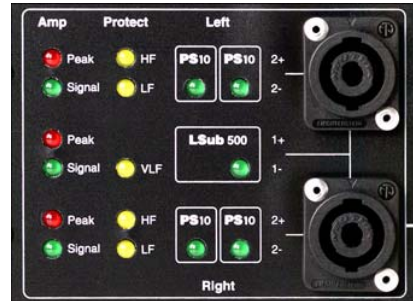
Sub On = 3 amplifier channels :

The two PS Stereo channels are assigned to poles 2+ and 2- on the L & R Speakons. A single PS LED lights up on each Stereo channel.

The LSub channel is Mono L+R summed and assigned in parallel to poles 1+ and 1- of both Speakons. The LS LED lights up.

Sub Off = 2 amplifier channels:

The two PS Stereo channels are assigned to poles 2+ and 2- on the L & R Speakons. Two PS LEDs are lighted on each channel. Poles 1+ and 1- of both Speakons are disconnected. The LS LED is off.



## Sub Bass Channel

The LSub On Switch automatically reconfigures the PSamp according to its two operating modes :

Sub On = 3 amplifier channels :

2 x 430 Watts into 8 Ohm channels feed two PSs in Stereo.

1 x 850 Watts into 4 Ohm channel feeds the LSub in Mono L+R.

Sub Off = 2 amplifier channels :

2 x 850 Watts into 4 Ohm channels feed two or four PS10s in Stereo.

The 1700 W power capability of the PSamp is always used whether or not the LSub is operated. The Sub amplifier channel is rerouted to the PS10s in the Sub Off operating mode. In both cases the installation is always stereophonic.

## Level control

The Level control operates simultaneously on all 2 or 3 channels according to configuration.



The LSub Level control adjusts the level of the LSub relative to the PS when Sub is On.

## Fuses and Mains

115/230 V mains Voltage selection, Main fuses and Earth-Lift configuration are located under the safety

cover on the front panel (lower right corner).

Earth-Lift configuration can be accessed without removing the safety panel by pushing with a small screwdriver the earth lift switch through two tiny holes in the safety cover. The upper hole switches to "Ground on", the lower hole to "Ground off" (earth lifted).

Changing the Voltage configuration or the fuses requires the opening of the safety cover (2 outer screws). 115/230 V mains configuration is made by pushing a switch (according to the silk screen painting) through two holes. The main fuses are the same in both configurations (no change is required). In the event of a main fuse failure **both** fuses shall be changed. The fuses are 5x20mm type temporized.

Fuse reference: T6.3AH250

Note: Two other fuses are located inside the unit on the PCB. Those fuses should never fail in normal operation. In the event of a failure do not replace those fuses yourself, as something else could be faulty. Contact an authorized dealer.

The mains power cable can be located on the front or on the back of the PS Amp. Changing the mains cable from the front to the back shall be made by an authorized dealer. No other control or connection exists on the back of the amplifier. At installation nothing else is required than sufficient air flow path on the back of the PS10Amp.

## Stand alone Amplifiers

### Recommended Power

NEXO recommends high power amplifiers in all cases, budget constraints being the only reason to select lower power amplifiers. If a problem occurs on an installation without protection, the use of a lower power amplifier generating half their rated output power (-3dB) will not prevent possible damage. This is due to the fact that the RMS power handling of the weakest component in the system is always 6 to 10 dB lower than the amps' rating

### Current Rating

It is very important that the selected amplifier behaves correctly under low load conditions. A speaker system is reactive by nature, on transient signals like music it will require much higher instantaneous current than its nominal impedance would indicate (four to ten times more). Amplifiers are usually specified by their continuous RMS power into resistive loads (which is irrelevant); the only useful information in that regard is the specification into a 2 ohms load. It is possible to make an amplifier listening test by loading the amplifier with twice the number of cabinets considered for the application (2 speakers per channel instead of one, 4 instead of 2...) and modulating at high level (onset of clipping). If the signal does not noticeably deteriorate the amplifier is well adapted (overheating after approximately ten minutes is normal but thermal protection must not operate too quickly after starting this test).

### Gain

It is very important to know the voltage gain of all amplifiers present in your set-up. This will ensure the correct alignment of your system and may be obligatory (for reliability) in cases where only one TDcontroller drives several amps. The tolerance should be about  $\pm 0,5$  dB. In practice this can be difficult to achieve:

Some amplifier brands have an identical input sensitivity for models of different power ratings (this means DIFFERENT VOLTAGE GAIN for each model). This problematic practice, inherited from non-

professional applications, is easily detected when the manufacturer specifies the same input sensitivity for all its range (like 775mV/0dBm or 1.55V/+6dBm). This translates into very high gain values on higher power models.

Other brands do offer constant gain, but often only within a given product range (like higher gain on all semi-professional amps).

Even if a manufacturer is aware of this problem and applies the constant gain rule to all its models, the value chosen is not necessarily the same as other manufacturers.

Some manufacturers deliver products where manufacturing tolerance on the same model is ±1dB or more. Worse, the manufacturer might agree to modify this gain at the customer's request without clear and visible identification on the device. Other amps feature internal gain switches that make it difficult to know the amp gain without measuring or opening it.

In cases where you don't know the gain of your amplifier (or want to check it) please read the following instructions.

1/ Unplug any cabinet from the amp

2/ With a signal generator feed a sine wave (freq. within the audio range, 1000Hz for example) Amplitude Vin is not important (1V is rather convenient), ⚠ taking care not to choose a value that will overdrive the amp input!

3/ Measure the Amplitude Volt at the output of the amp.  $Gain = 20 * LOG_{10}(V_{out}/V_{in})$

Some examples:

Gain	20dB	26dB	32dB	37dB (1.4V sensitivity / 1350Wrms)
0.1V	1V	2V	4V	7.1V
0.5V	5V	10V	20V	35.4V
1V	10V	20V	40V	70.8V

Remember that constant sensitivity settings will give you different gain values when the amp Power is different.

Gain value

NEXO recommends low gain amplifiers: +26dB is recommended, as it is both adequately low and quite common. This gain level considerably improves signal to noise ratio and allows all preceding electronic gear, including the TDcontroller, to operate at an optimum level. Remember that using a higher gain amplifier will proportionally raise the noise floor level by the same amount.

Advanced protections

Some high-end amplifiers may have some advanced functions similar to those found in the NEXO TDcontrollers ("loudspeaker offset integration", "limiter", "compressor"...). These functions are not well adapted to NEXO system requirements and may interfere with existing protection within the TDcontroller. NEXO recommends disabling these functions.

## Analogue TDcontrollers Specifications

<b>PRODUCT FEATURES</b>	
Audio Inputs	Two differential non floating L&R Audio inputs, 50 kOhm. Two XLR-3F connectors.
Sense Inputs	Three Amplifier Sense Inputs (PS L&R, LS). 400 kOhm. 6 Pole Removable Strip Terminal
Audio Outputs	Two L&R PS Audio outputs. Balanced, non floating, 51 Ohm. Two XLR-3M. One Mono (L+R) LS400 Audio output. Balanced, non floating, 51 Ohm. One XLR-3M.
Controls	Gain switch (back panel), 3 positions : -6 / 0 /+6dB. Peak Limiter trimmer (600W-200W/8 Ohms) for PS8 & 10 Sub Overlap / Crossover switch & Sub Gain Control (-/+ 6dB).
Indicators	LF speakers Protect Yellow LED's (Temp. & Disp), Power ON (green), Amp Sense & Peak LED's (green/Red)
Dimensions	1U 19" Rack. 165mm (6.5") Depth
Weight :	2.9 kg (6.6 lbs) net
<b>SPECIFICATIONS</b>	
Output Section	+22 /+16/+10 dBm typ. into 600 Ohm load. Back Panel switch on +6/0/-6dB respectively.
Input Section	Maximum input Level : 22dBu. CMRR 90dB @ 1kHz typ.
THD+N	0.05% @ 1kHz Typ. for +10dBm Output
Noisefloor	PS8TD -100 dBV PS10TD: -103dBV PS15dB: -98dBV for 0dB switch position (22 Hz - 22 kHz, UnWeighted)
Dynamic Range	111 dB UnWeighted (THD+N at-60dB sine wave @1kHz rel.max. output)
Crosstalk	104dB
Filtering & EQ.	L&R: 12dB/oct Low Pass, 12dB/oct High pass (crossover or overlap), 4 Parameter EQs. All factory tuned
Protections	VCA temp. (SUB,LF & LF), VCEQ disp. (SUB & LF), Peak Limiter (all chanel), Power compression regulation
Power Supply	100-250 Volts (continuous operation), 50/60Hz. Power 9W. Peak Inrush current 0.5A. Earth-Lift.
Conformity	Comply with safety objective of 73/23/EEC & 89/336/EEC directives. (EN60065-12/2001, EN55103-1996). CB scheme DK-8371, cULus 60065 AZSQ E241312, FCC part15 class B
<b>SYSTEM OPERATION</b>	
Applicable Products	The PS8 TDcontroller is precisely matched to the PS & LS cabinets and includes sophisticated protection systems. Use of either product without a properly connected Controller will result in poor sound quality and may damage the components.
SubBass	Active two-way operation of the PS8 Loudspeaker with the LS Subwoofer is included in the Analogue PS TDcontroller .

## PS8 & LS400 : SPECIFICATIONS, CURVES & DIAGRAMS

SYSTEM SPECIFICATIONS	PS8 with PS8 TDcontroller	LSub 400 with PS8 TDcontroller
Frequency Response [a]	69 Hz - 19 kHz $\pm 3$ dB	43 Hz - 120 Hz $\pm 3$ dB
Usable Range @-6dB [a]	62 Hz - 20 kHz	40 Hz - 140 Hz
Sensitivity 1W @ 1m [b]	96 dB SPL Nominal - 94 dB SPL Wideband	99 dB SPL Nominal
Nominal Peak SPL @ 1m [b]	122 to 125dB Peak (for 200 to 500 W RMS Amp.)	128 to 131 dB Peak (300 to 700 W RMS Amp.)
HF Dispersion [c]	50° to 100° Hor. x 55° Vert. Rotatable Horn, 4 positions	-
Directivity : Q & DI [c]	Q : 10 Nominal DI : 10 dB Nominal ( f > 1.8 kHz )	-
Crossover Frequencies	2.5 kHz Passive	120 Hz Active through PS8TD
Nominal Impedance	8 Ohms	6 Ohms
Recommended Amplifiers	200 to 500 Watts into 8 Ohms for 1 x PS8 per channel 400 to 1000 Watts into 4 Ohms for 2 x PS8 per channel	300 to 700 Watts into 4 Ohms

SYSTEM OPERATION	
Electronic Controller	The PS8 TDcontroller is precisely matched to the PS8 & LS400 cabinets and includes sophisticated protection systems. Using PS8 & LS400 without a properly connected PS8TD will result in poor sound quality and can damage the components. PS8 & LS400 can also be used with the NX242 Digital TDcontroller.
Dispersion configuration	After quick-release of the front grille from its fixings, the HF Horn can be rotated in 4 positions for dispersion configuration.
Subbass	The PS8 can be used without optional LS400 Subbass. Active two-way operation with the LS400 is included in the PS8TD. One LS400 matches 2 x PS8, additional LS400 may be used for enhanced effect.
Speaker Cables	PS8 are wired 2- & 2+ on Speakon connectors, LS400 on 1- & 1+. Loop through Speakons are present on both. Single identical cables can thus be used to loop through combinations of up to 2 x PS8 & 1 x LS400 in no particular order.

PRODUCT FEATURES	PS8	LSub 400
Components : LF [VLF]	1 x 8" (20cm) Shielded Neodymium 8 Ohms driver	1 x 12" ( 30cm ) long excursion 6 Ohm driver
HF	1 x 1" Shielded Neodymium throat driver + Low Distorsion, Constant Directivity Asymetrical Dispersion Horn.	-
Height x Width x Depth	406 x 250 x 219 mm (16"x 9 7/8"x 5 5/8")	338 x 500 x 406 mm (13 1/4"x 19 5/8"x 16")
Weight : Net	7.5 kg (16.5 Lb)	19.5 kg (43 Lb)
Connectors	2 x NL4MP SPEAKON 4 pole	2 x NL4MP SPEAKON 4 pole
Construction	Baltic Birch Ply finished with structured black coating	Baltic Birch Ply & structured black coating
Fittings: Handles	-	2 Metal Handles
Front finish	Perforated steel grille	-
Flying Points & Fixed Installation	Threaded inserts are fitted as standard to all cabinet surfaces for connection of mounting accessories	-
Stand fittings	Built in Stand Fitting, 35mm (1 3/8)	Internal Stand Fitting on Top (35mm, 1 3/8) accepts a mast supporting 1 or 2 PS8's.

SHIPPING & ORDERING	
Packaging	PS8's are packaged as pairs with or without PS8TD in a single box.
Shipping weight & Volume	2 x PS8.U = 16 Kg (35.28 lb.) 0.109 cu m (3.85 cu feet). 2 x PS8.U + 1 x PS.8TD = 19.00 Kg (6.61 lb.) 0.109 cu m (3.85 cu feet). LS.400 = 22 kg (48.5 lb.) 0.130 cu m (4.59 cu feet).
Accessories	A full selection of mounting Accessories is available, please contact your Nexo Agent for details.

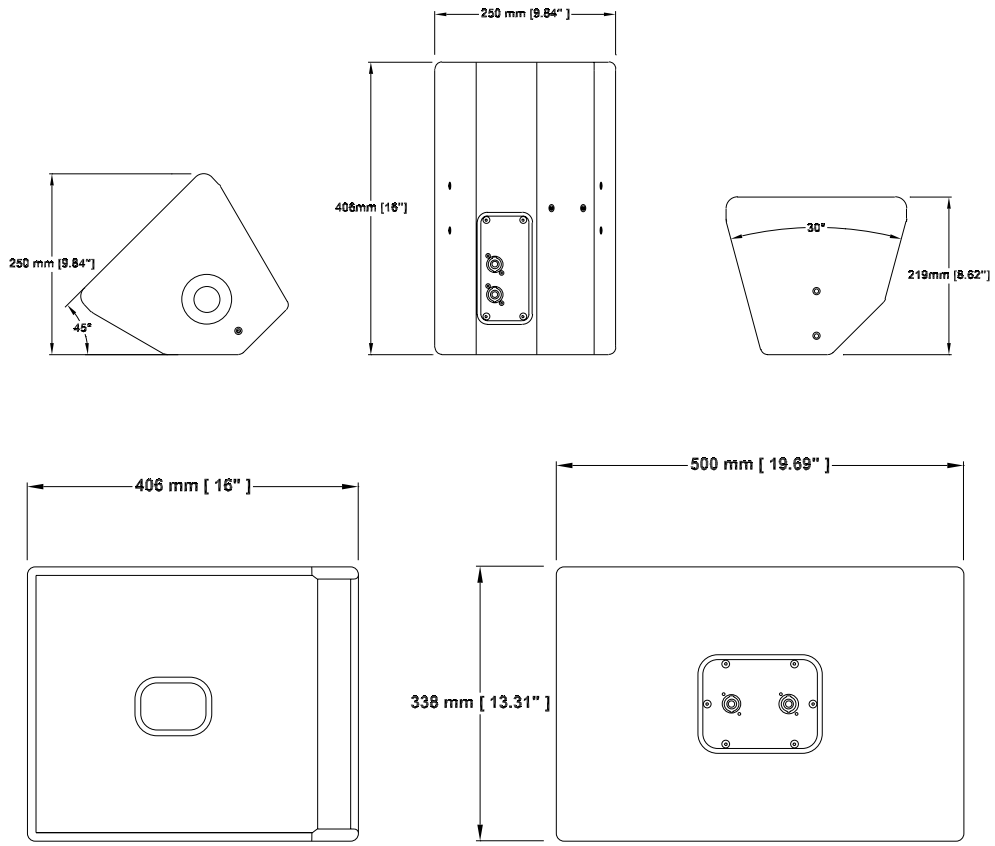
As part of a policy of continual improvement, NEXO reserves the right to change specifications without notice.

[a] Response curves & data : Anechoic Far Field for the PS8 + PS8TD. Half-Space Anechoic radiation for the LS400 + PS8TD.

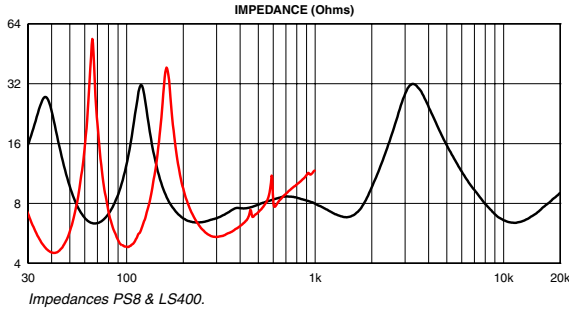
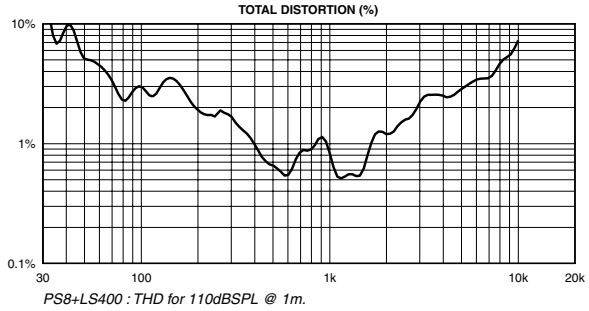
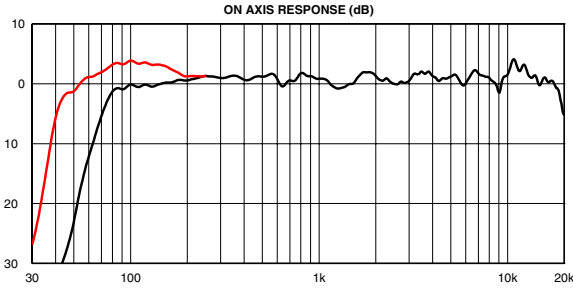
[b] Sensitivity & Peak SPL data : these will depend on spectral distribution and crest factor of program material. Measured with band limited Pink Noise. Nominal refers to Voice Decade (300 Hz - 3 kHz), Wideband to the specified  $\pm 3$ dB range. Data are for speaker + processor + recommended amplifier combinations. Peak SPL is at clipping of recommended amplifier.

[c] Directivity curves & data : obtained by computer treatment on off axis response curves.

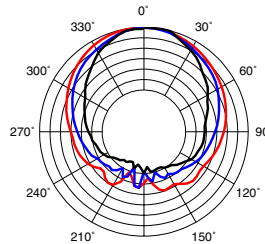
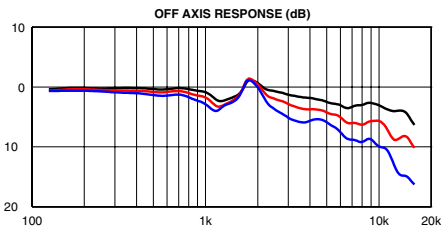
Dimensions



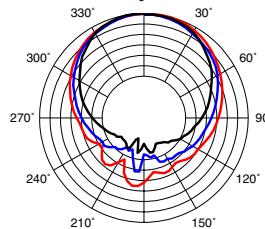
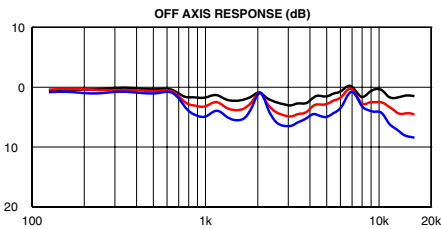
**PS8 curves**



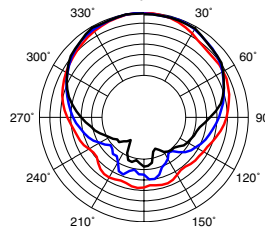
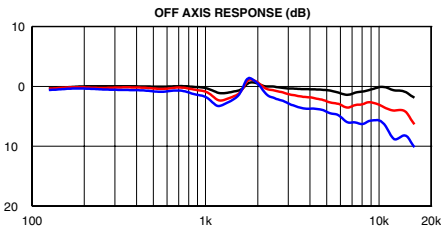
All measurements made with PS8TDcontroller.  
 Response curves : Far Field, Halfspace below 200Hz, anechoic above 200Hz.  
 Off axis response and polar plot : 1/3 octave averaged anechoic measurements.  
 Vertical orientations refer to the cabinet in front of house configuration.  
 Directivity index and factor : computer treatment of polar plots.



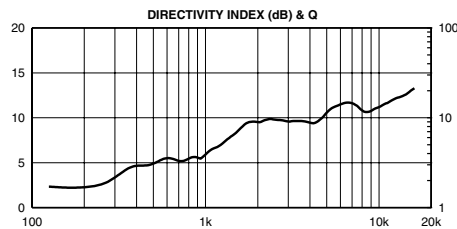
Horizontal polar plot (left), 5dB/division.  
 Upper plot : vertical orientation +25°.  
 Center plot : vertical orientation 0°.  
 Lower plot : vertical orientation -25°.



Above : vertical Polar plot. 5dB/division.

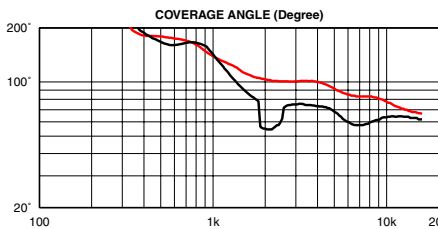


2 500 Hz Red  
 5 000 Hz Blue  
 10 000 Hz Black



Directivity Index and Factor

PS SERIES MANUAL REV3 10/10/05



Horizontal (light) and Vertical (black) Coverage Angles, -6dB point.

## PS10 & LS500 : SPECIFICATIONS, CURVES & DIAGRAMS

SYSTEM SPECIFICATIONS	PS10 with PS10 TDcontroller	LSub 500 with PS10 TDcontroller
Frequency Response [a]	65 Hz - 20 kHz $\pm$ 3dB	40 Hz - 110 Hz $\pm$ 3dB
Usable Range @-6dB [a]	58 Hz - 21 kHz	38Hz - 120 Hz
Sensitivity 1W @ 1m [b]	98 dB SPL Nominal - 96 dB SPL Wideband	101 dB SPL Nominal
Nominal Peak SPL @ 1m [b]	124 to 127 dB Peak (for 200 to 500 W RMS Amp.)	131 to 134 dB Peak (300 to 800 W RMS Amp.)
HF Dispersion [c]	50° to 100° Hor. x 55° Vert. Rotatable Horn, 4 positions	-
Directivity : Q & DI [c]	Q : 16 Nominal DI : 12 dB Nominal ( f > 3 kHz )	-
Crossover Frequencies	2 kHz Passive	120 Hz Active through PS10 TD
Nominal Impedance	8 Ohms	4 Ohms
Recommended Amplifiers	200 to 500 Watts into 8 Ohms for 1 x PS10 per channel 400 to 1000 Watts into 4 Ohms for 2 x PS10 per channel	300 to 800 Watts into 4 Ohms

SYSTEM OPERATION	
Electronic Controller	The PS10 TDcontroller is precisely matched to the PS10 & LS500 cabinets and includes sophisticated protection systems. Using PS10 & LS500 without a properly connected PS10 TD will result in poor sound quality and can damage the components.
Dispersion configuration	After quick-release of the front grille from its fixings, the HF Horn can be rotated in 4 positions for dispersion configuration.
SubBass	The PS10 can be used without optional LS500 SubBass. Active two-way operation with the LS500 is included in the PS10 TD. One LS500 matches 2 x PS10, additional LS500 may be used for enhanced effect.
Speaker Cables	PS10 are wired 2- & 2+ on Speakon connectors, LS500 on 1- & 1+. Loop through Speakons are present on both. Single identical cables can thus be used to loop through combinations of up to 2 x PS10 & 1 x LS500 in no particular order.

PRODUCT FEATURES	PS10	LSub 500
Components : LF [VLF]	1 x 10" (25cm) 8 Ohm driver	1 x 15" (38cm) long excursion 4 Ohm driver
HF	1 x 1" throat driver + Low Distorsion, Constant Directivity Asymmetrical Dispersion Horn.	-
Height x Width x Depth	515 x 316 x 277 mm (20.28"x 12.44"x 10.91")	430 x 689 x 528 mm (16.93"x 27.13"x 20.79")
Weight : Net	15 kg (33 Lbs)	33 kg (73 Lbs)
Connectors	2 x NL4MP Speakon 4 pole	2 x NL4MP Speakon 4 pole
Construction	Baltic Birch Ply finished with structured black coating	Baltic Birch Ply & structured black coating
Fittings: Handles	2 Metal recessed pockets	2 Metal recessed pockets
Front finish	Acoustic foam on hex perforated steel grille (77% transparent)	Perforated steel grilles
Flying Points	1 steel anchor plate for flying track on top (6 positions). 2 steel anchor plates for flying tracks on bottom (1 position)	3 steel anchor plates for flying tracks on sides and back
Stand fittings	Built in Steel Stand Fitting, 35mm (1"3/8)	Internal Steel Stand Fitting on Top (35mm, 1"3/8) accepts a mast supporting 1 or 2 PS10's.
Fixed Installation	Two sets of 4 fixing points (Omnimount 100 Std spacing) for Horizontal or Vertical installation.	-
Power Supply	110/220 Volts (internal wiring), 50/60Hz.	Earth-Lift (back panel)
Dimensions & Weight	1U 19" Rack. 190mm (7.5") Depth.	2.9 kg (6.6 Lbs) net

SHIPPING & ORDERING	
Packaging	PS10's are packaged as pairs with PS10TD (Ref: PS10P+T) or without PS10TD (Ref: PS10P) in a single box.
Shipping weight & Volume	Ref PS10P : 34 Kg (pair). Ref PS10P+T : 37 Kg (pair+processor). Shipping Volume : 0.169 m3 ( 5.96 cu feet) Ref LS500 : 38 kg (unit) 0.238 m3 (8.41 cu feet)



Accessories	Flying Kit (Ref: FLYPS10) containing 1 x PS10 Top Rail, 2 x PS10 Bottom Rails, 4 x Single Stud Flying Rings. Mast Adapter Kit (Ref: STDUPS10) containing 1 m (39") long mast & U coupler supporting 1 or 2 PS10 above LS500
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As part of a policy of continual improvement, NEXO reserves the right to change specifications without notice.

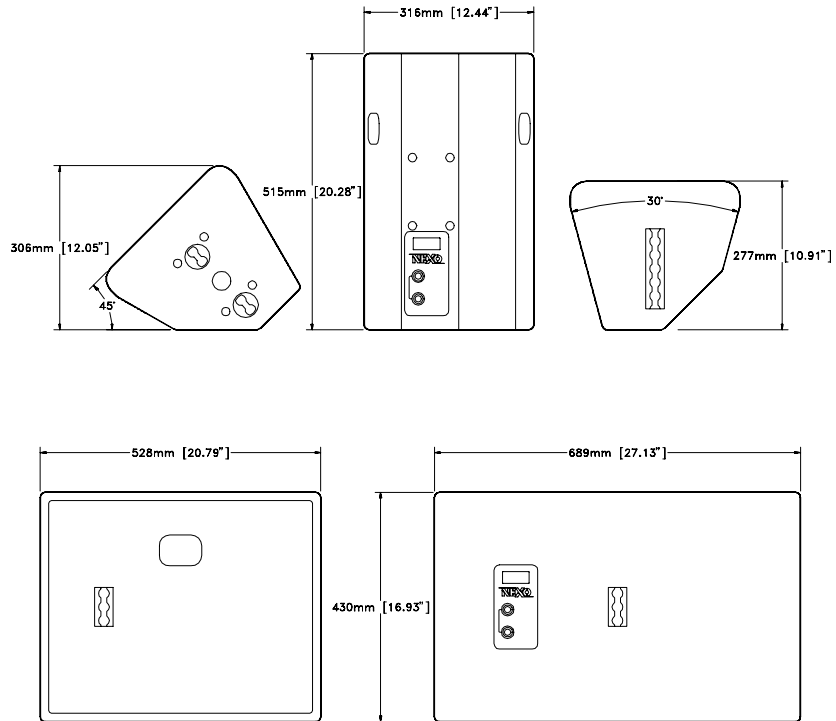
[a] Response curves & data : Anechoic Far Field for the PS10 + PS10TD. Half-Space Anechoic radiation for the LS500 + PS10TD.

[b] Sensitivity & Peak SPL data : these will depend on spectral distribution and crest factor of program material. Measured with band limited Pink Noise. Nominal refers to Voice Decade (300 Hz - 3 kHz), Wideband to the specified  $\pm 3$ dB range. Data are for speaker + processor + recommended amplifier combinations. Peak SPL is at clipping of recommended amplifier.

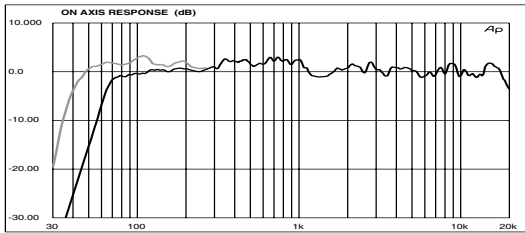
[c] Directivity curves & data : obtained by computer treatment on off axis response curves.

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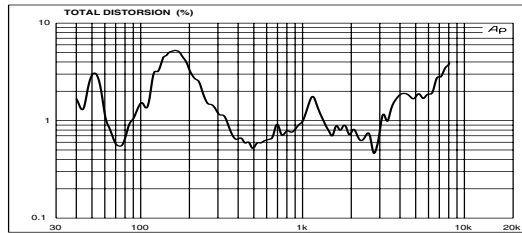
### Dimensions



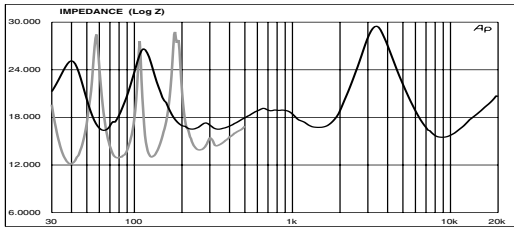
PS10 Curves



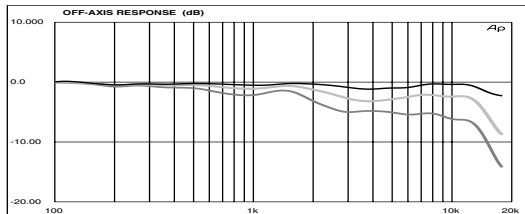
c 1 : On axis responses PS10 & PS10 + LS500



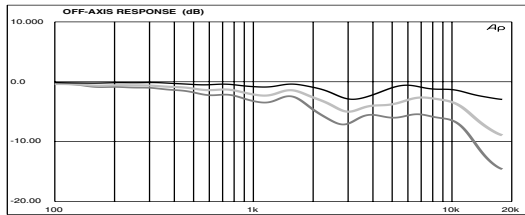
c 2 : PS10 + LS500 : THD for 110 dB SPL @ 1m.



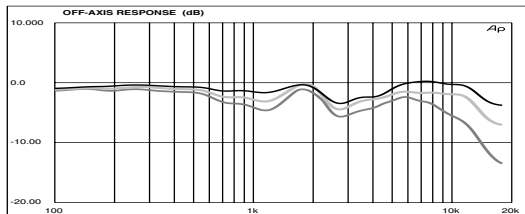
c 3 : Impedance PS10 and LS500



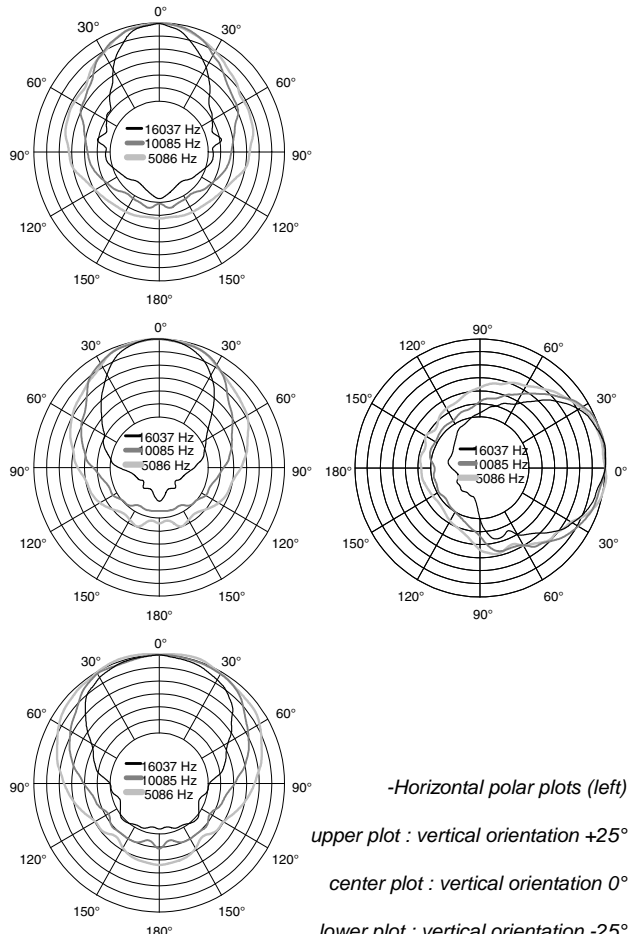
c 4 : Horizontal plane, vertical orientation +25°. 10°(black),20°(light),30°(dark) off axis response



c 5 : Horizontal plane, vertical orientation 0°. 20°(black),30°(light),40°(dark) off axis response



c 6 : Horizontal plane, vertical orientation -25°. 30°(black),40°(light),50°(dark) off axis response



-Horizontal polar plots (left)

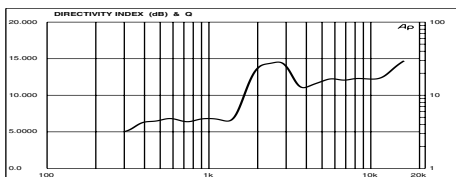
upper plot : vertical orientation +25°

center plot : vertical orientation 0°

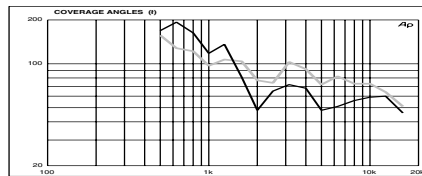
lower plot : vertical orientation -25°

-Vertical polar plot (right)

5 dB / div

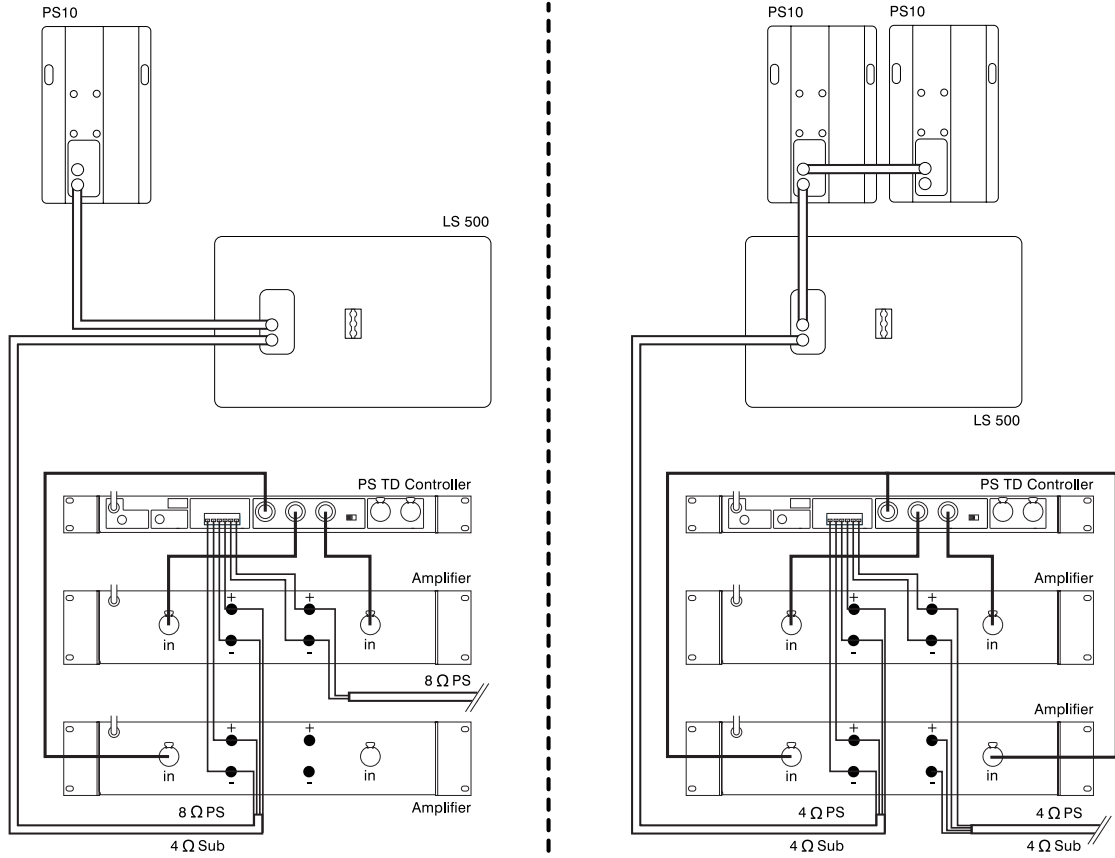


c7 : Directivity index and factor.



c 8 : Horizontal (light) and vertical (black) coverage angles, -6dB points.

Connection Diagrams



## PS15 & LS1200 : SPECIFICATIONS, CURVES & DIAGRAMS

SYSTEM SPECIFICATIONS	PS15 with PS15 TDcontroller MK2	LSub 1200 with PS15 TDcontroller MK2
Frequency Response [a]	50 Hz - 18 kHz $\pm 3$ dB	30 Hz - 120 Hz $\pm 3$ dB
Usable Range @-6 dB [a]	47 Hz - 18 kHz	29 Hz - 130 Hz
Sensitivity 1W @ 1m [b]	102 dB SPL Nominal. 99 dB SPL Wideband	102 dB SPL Nominal
Nominal Peak SPL @ 1m [b]	131 to 134 dB Peak (for 550 to 1200 W RMS Amp.)	133 to 135 dB Peak (800 to 1200 W RMS Amp.)
HF Dispersion [c]	50° to 100° Hor. x 55° Vert. Rotatable Horn - 4 positions	-
Directivity : Q & DI [c]	Q : 16 Nominal      DI : 12 dB Nominal      ( f > 1.5 kHz )	-
Crossover Frequencies	900 Hz Passive or Active (internally switchable)	80 Hz Active through PS15 TD
Nominal Impedance	Passive : 8 Ohms or Active : LF : 6 Ohms & HF : 8 Ohms	6 Ohms
Recommended Amplifiers	550 to 1200 Watts into 8 Ohms for 1 x PS15 per channel 1000 to 1800 Watts into 4 Ohms for 2 x PS15 per channel	800 to 1200 Watts into 8 Ohms -
SYSTEM SPECIFICATIONS	PS15Bass with PS15 TDcontroller	
Frequency Response	40 Hz - 300 Hz	
Sensitivity 1W @ 1m	102 dB SPL Nominal. 99 dB SPL Wideband	
Nominal Peak SPL @ 1m	131 to 134 dB Peak (for 550 to 1200 W RMS Amp)	
Cutoff Frequency	120 Hz Passive - 6dB per Octave - Reactance compensation	
Nominal Impedance	8 Ohms	
Recommended Amplifiers	550 to 1200 Watts into 8 Ohms for 1 x PS15Bass per channel 1000 to 1800 Watts into 4 Ohms for 1 x PS15Bass + 1 x PS15 or 2 x PS15Bass per channel	

SYSTEM OPERATION	
Electronic Controller	The PS15 TDcontroller is precisely matched to the PS15 & LS1200 cabinets and includes protections. Using PS15 & LSub's without a properly connected PS15 TD will result in poor sound quality and can damage the components.
Dispersion configuration	After quick-release of the front grille from its fixings, the HF Horn can be rotated in 4 positions for dispersion configuration.
SubBass	The PS15 can be used without optional Subbass. Active operation of the LS1000 is included in the PS15 TD.
Speaker Cables	PS15 are wired 2- & 2+ on Passive Input Speakons, LS1000 on 1- & 1+. Loop through Speakons are present on both. Single identical cables can thus be used to loop through combinations of PS15 in passive & LS1000 in no particular order.

PRODUCT FEATURES	PS15	LSub 1200
Components :LF [Sub] HF	1 x 15" (38 cm) 6 Ohms proprietary 1 x 2" throat, 3" Titanium diaphragm, driver + Low Distortion, Constant Directivity Asymmetrical Dispersion Horn.	1 x 18" (46 cm) long excursion 6 Ohm proprietary driver -
Height x Width x Depth	675 x 434 x 368 mm (26.57"x 17.08"x 14.48")	515 x 791 x 597 mm (20.28"x 31.14"x 23.50") Dimensions of 2 stacked LS1200 = 1 x LS2000
Weight : Net	29 kg (64 Lb.)	45 kg (99 Lb.)
Speakon Connectors	2 x 4 pole (Passive In & Loop Thru) + 1 x 4 Pole (Active In)	2 x 4 pole (In & Loop Thru)
Construction	Baltic Birch Ply finished with structured black coating	Baltic Birch Ply & structured black coating
Fittings: Handles	2 Metal recessed pockets	2 Metal recessed pockets
Front finish	Acoustic foam on hex perforated steel grille (77% transparent)	Perforated steel grilles
Flying Points	1 steel anchor plate for flying track on top (9 positions). 2 steel anchor plates for flying tracks on bottom (3 positions)	3 steel anchor plates for flying tracks on sides and back
Stand fittings	Built in Steel Stand Fitting, 35 mm (1"3/8)	Internal Steel Stand Fitting on Top (35 mm, 1"3/8) accepts a mast supporting 1 or 2 PS15's.

Fixed Installation	One set of 4 fixing points (Omnimount 100 Std spacing)
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PRODUCT FEATURES		PS15Bass
Components :	1 x 15" (38 cm) proprietary. Identical to the PS15 LF unit	
Height x Width x Depth.	675 x 434 x 457 mm (26.57"x 17.08"x 17.99")	
Weight : Net	26 kg (57 Lb)	
Speakon Connectors	2 x 4 poles (Passive In & Loop Thru) + 1 x 4 pole (Active)	
Construction	Baltic Birch Ply finished with structured black coating	
Fittings : Handles	2 Metal Handles	
Front Finish	Acoustic foam on Hex perforated steel grille (77% transparent)	
Flying Points	1 steel anchor plate for flying track on bottom (9 positions). 2 steel anchor plates for flying tracks on top (3 positions).	

SHIPPING & ORDERING	
Packaging	PS15's are sold as pairs with PS15TD
Shipping weight & Volume	PS15 : 32 Kg (70 lb.) 0.2 cum (7 cu feet). PS15 TD : 3.85 Kg (8.47 lb.) 0.02 cu m (0.6 cu feet) Ref. LS1200 : 49 kg (108 lb.) 0.32 cu m (11 cu feet)
Accessories	Flying Kit (Ref.: FLYPS15) containing 1 x PS15 Top Rail, 2 x PS15 Bottom Rails, 4 x Single Stud Flying Rings. Mast Adapter Kit (Ref.: STDUPS15) containing 1 m (39") long mast & U coupler supporting 1 or 2 PS15 above LS1000.

As part of a policy of continual improvement, NEXO reserves the right to change specifications without notice.

[a] Response curves & data : Anechoic Far Field for the PS15 + PS15TD. Half-Space Anechoic radiation for the LS1000 + PS15TD.

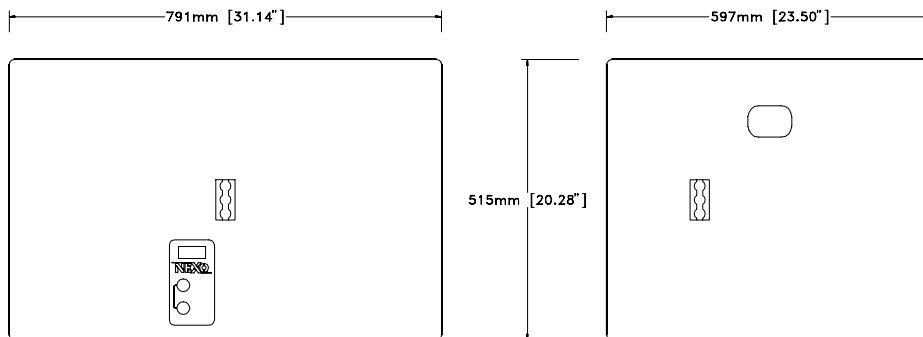
[b] Sensitivity & Peak SPL data : these will depend on spectral distribution and crest factor of program material. Measured with band limited Pink Noise.

Nominal refers to Voice Decade (300 Hz - 3 kHz), Wideband to the specified ±3 dB range. Data are for speaker + processor + recommended amplifier combinations. Peak SPL is at clipping of recommended amplifier. Measurements made with PS15's in passive operation mode.

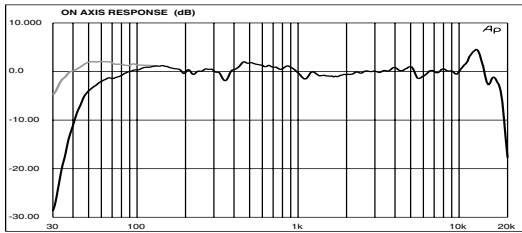
[c] Directivity curves & data : obtained by computer treatment on off axis response curves.

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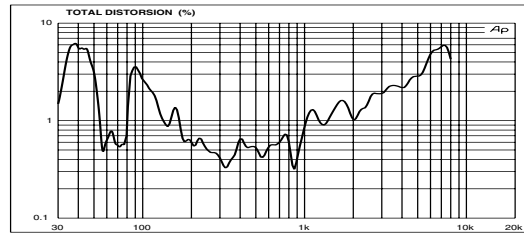
### Dimensions



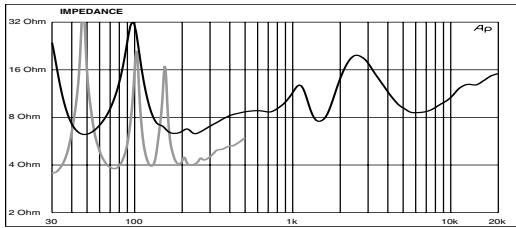
PS15 : Curves



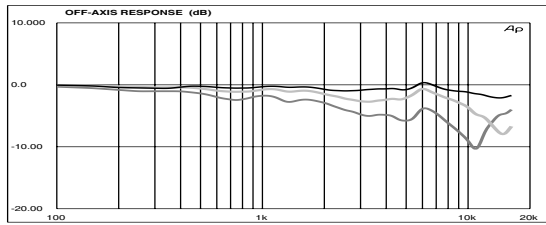
c 9 : On axis responses PS15 & PS15 + LS1000



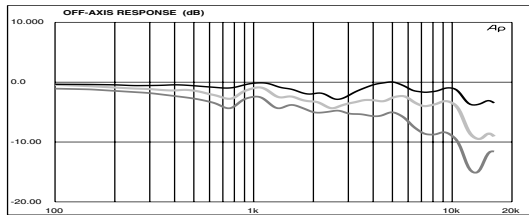
c 10 : PS15 + LS1000 : THD for 115 dB SPL @ 1m.



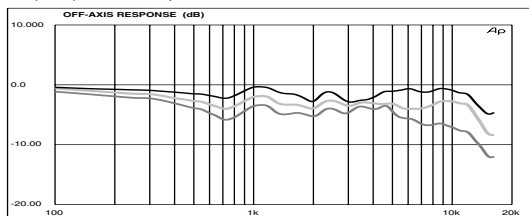
c 11 : Impedance PS15 and LS1000



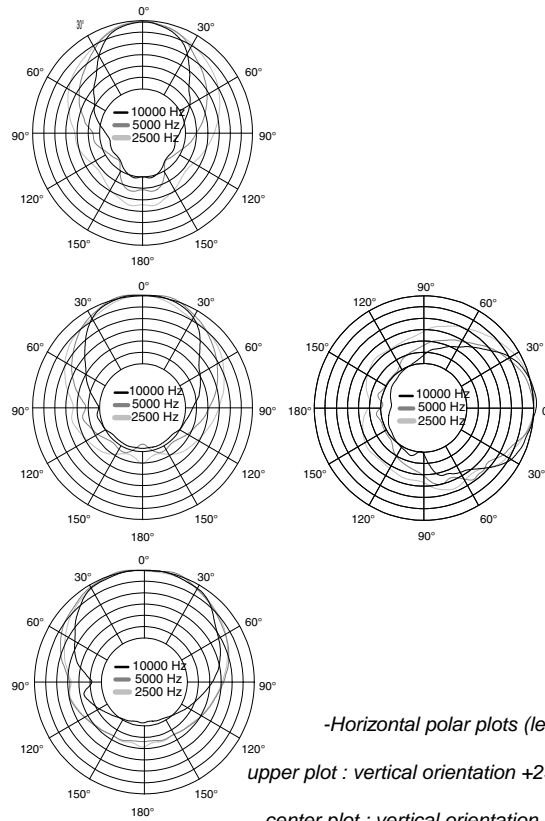
c 12 : Horizontal plane, vertical orientation +25°. 10°(black),20°(light), 30°(dark) off axis response



c 13 : Horizontal plane, vertical orientation 0°. 20°(black),30°(light), 40°(dark) off axis response



c 14 : Horizontal plane, vertical orientation -25°. 30°(black), 40°(light),50°(dark) off axis response



-Horizontal polar plots (left)

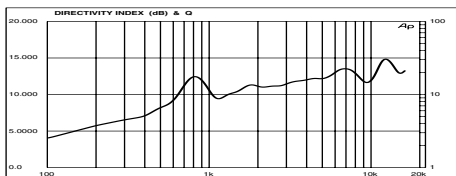
upper plot : vertical orientation +25°

center plot : vertical orientation 0°

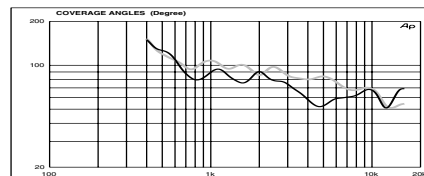
lower plot : vertical orientation -25°

-Vertical polar plot (right)

5 dB / div

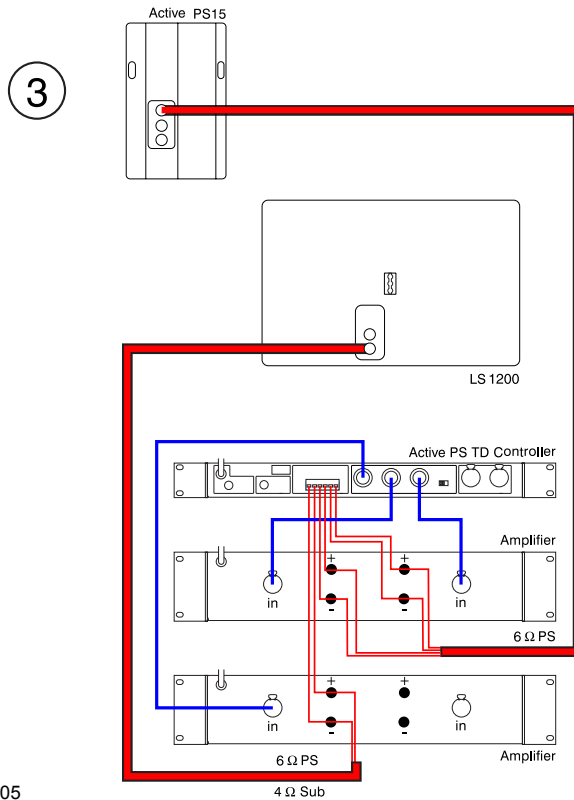
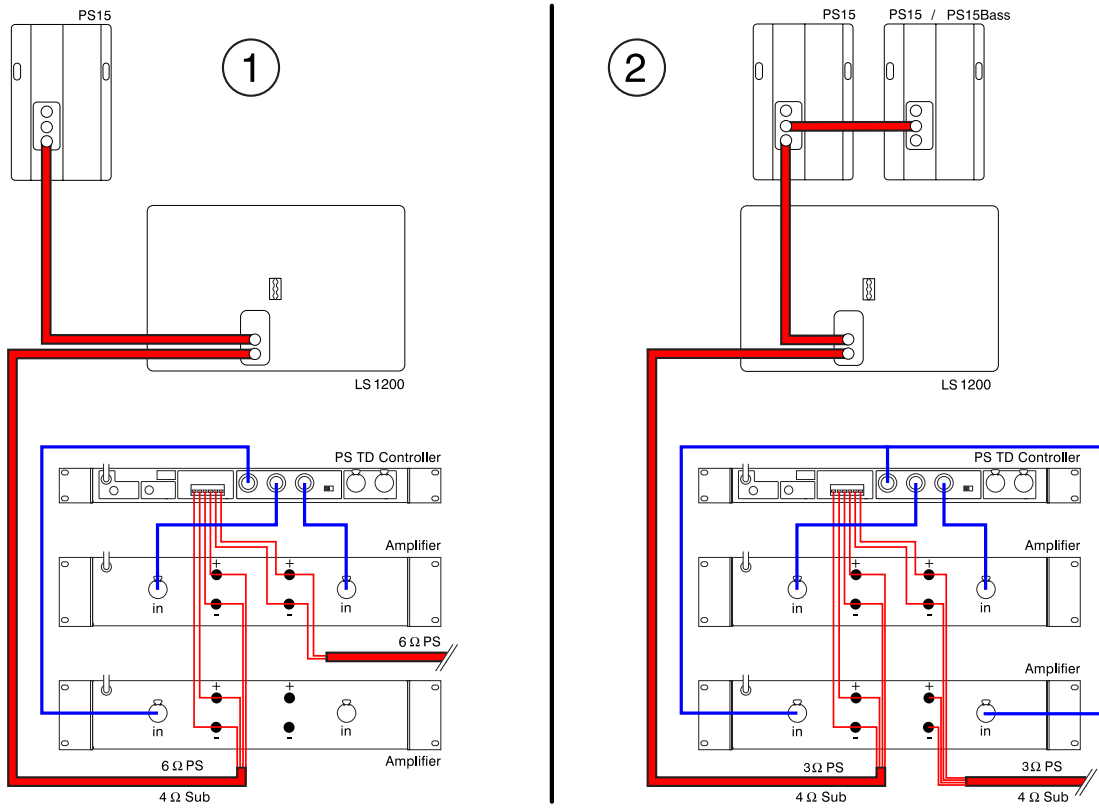


c 15 : Directivity index and factor



c 16 : Horizontal (light) and vertical (black) coverage angles, -6dB points.

Connection Diagrams



User notes