



PS Series

PS8 - PS8TD - LS400 - PS8Amp

PS10 - PS10TD - LS500 - PS10Amp

PS15 - PS15Bass - PS15TDMK2 - LS1200



User Manual

Norms: TDcontrollers



Those equipments have been tested and found to comply with the following European and international Standards for electromagnetic Compatibility and electrical Safety:

- Electrical safety CEI65
- Radiated & conduction emission EN55022: Information technology equipment. Radio disturbance characteristics. Limits and methods of measurement.

Norms: PS Amps



This equipment has been tested and found to comply with the following European and international Standards for electromagnetic Compatibility and electrical Safety:

- Electrical safety CEI65
- EN55013 (emission) Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment.
- EN55020 Electromagnetic immunity of broadcast receivers and associated equipment..
- EN60555-2 Disturbances in supply systems caused by household appliances and similar electrical equipment. Part 2 : harmonics
- EN 50082-1 Electromagnetic compatibility. Generic immunity standard. Part 1 : residential, commercial and light industry.

Norms: All PS cabinet & LS cabinets



All cabinet described in this manual as passive components are found to comply with the following European and international Standards for electromagnetic Compatibility

- EN50081-1: Electromagnetic compatibility. Generic emission standard. Part 1 : residential, commercial and light industry.
- EN50082-1 : Electromagnetic compatibility. Generic immunity standard. Part 1 : residential, commercial and light industry.

Safety Warning concerning TDcontrollers

This unit is fitted with 3-pin IEC standard power socket. For safety reasons the earth should not be disconnected.

To prevent shock or fire hazard, do not expose the unit to rain or moisture. To avoid electrical shock, do not remove covers. Dangerous voltages exist inside. Refer servicing to qualified personnel only

INTRODUCTION..... 4

LOUDSPEAKERS 4

GENERAL SETUP INSTRUCTIONS 4

ASYMMETRICAL HORN CONFIGURATION..... 7

ACTIVE / PASSIVE CONFIGURATION (PS15 ONLY) 8

SUB BASS USE (OPTIONAL)..... 9

IMPEDANCE COMPENSATION NETWORK (ICN) (PS15 ONLY)..... 9

ACCESSORIES 10

USE & MAINTENANCE 12

TDCONTROLLER USER GUIDE 14

READ BEFORE USE..... 14

PS15TD MK2: COMPATIBILITY WITH FORMER PS15TD, LS1000 & PS15 CABINETS 15

FRONT PANEL..... 15

REAR PANEL..... 18

FOLLOWING FUNCTIONS CONCERN PS15TD MK2 ONLY 20

SETTING-UP ADVICE..... 22

TDCONTROLLER REFERENCE GUIDE..... 23

LINEAR SECTION 23

SERVO CONTROL SECTION 23

AMPLIFIERS..... 26

PS8AMP & PS10AMP 26

STAND ALONE AMPLIFIERS..... 28

PS8, PS8TD & LS400 : SPECIFICATIONS, CURVES & DIAGRAMS 30

PS10, PS10TD & LS500 : SPECIFICATIONS, CURVES & DIAGRAMS 33

PS15, PS15TD MKII & LS1200 : SPECIFICATIONS, CURVES & DIAGRAMS 37

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 sub bass
- PS10 & optional LS500 sub bass
- PS15 & optional LS1200 sub bass and PS15Bass

The PS15 can be used in either passive or bi-amped mode (two-way active).

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

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.

- PS8 TDcontroller for PS8 systems (with or without LS400).
- PS10 TDcontroller for PS10 systems (with or without LS500).
- PS15 TDcontroller MK2 for PS15 systems (with or without LS1200).
- NX241 Digital TDcontroller set on the appropriate set-up (See "NX241 User Manual")

These controllers are not interchangeable. Each one is precisely matched to the corresponding cabinets. Excepted NX241 that covers the entire NEXO range.

NOTE: Earlier PS15TDs (up to serial number 1518) were designed for PS15s without the Impedance Compensation Network (ICN) (serial number < 23853) and the LS1000 Sub. Using these on newer cabinets will result in a degradation of sound quality. See page 15 for more information.

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+	⇒	Sub bass + (optional)
pin 1-	⇒	Sub bass - (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) 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 ² [AWG # 14]	12 m [40 ft]	6 m [20 ft]
2,5 mm ² [AWG #12]	20 m [64 ft]	10 m [32 ft]
4 mm ² [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 power ramp up on an hour period. 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.

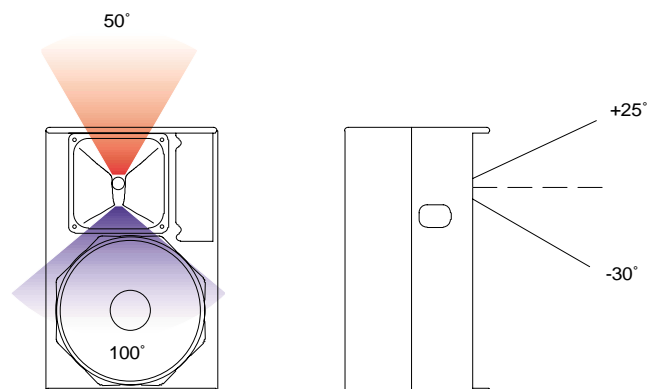
The specific dispersion of the PS8, PS10 & PS15 horn can be seen on figure 1 ("front of house" configuration):

- 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.

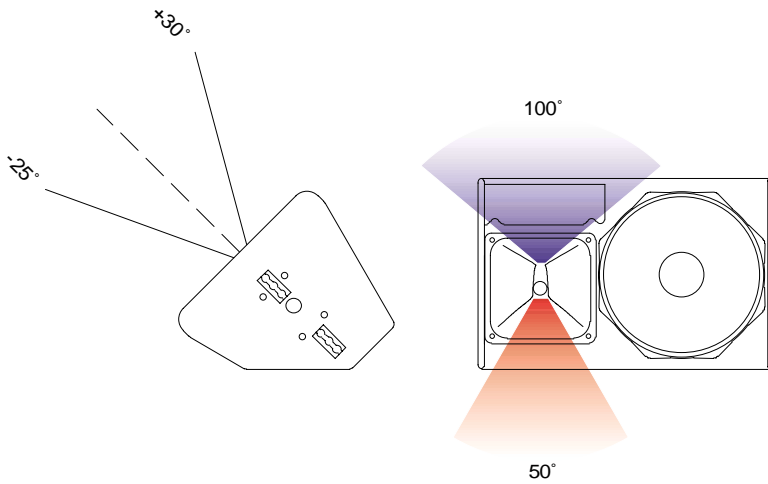
Access to the horn for configuration and checking is easily made by removing the front grille (pull gently the sides of the grille to disconnect the press-stud fixings). To modify horn orientation, remove the four Allen 4 metric or TORX TX25 screws (depending of model and age of the cabinet) that hold 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



PS15 as a wedge monitor.

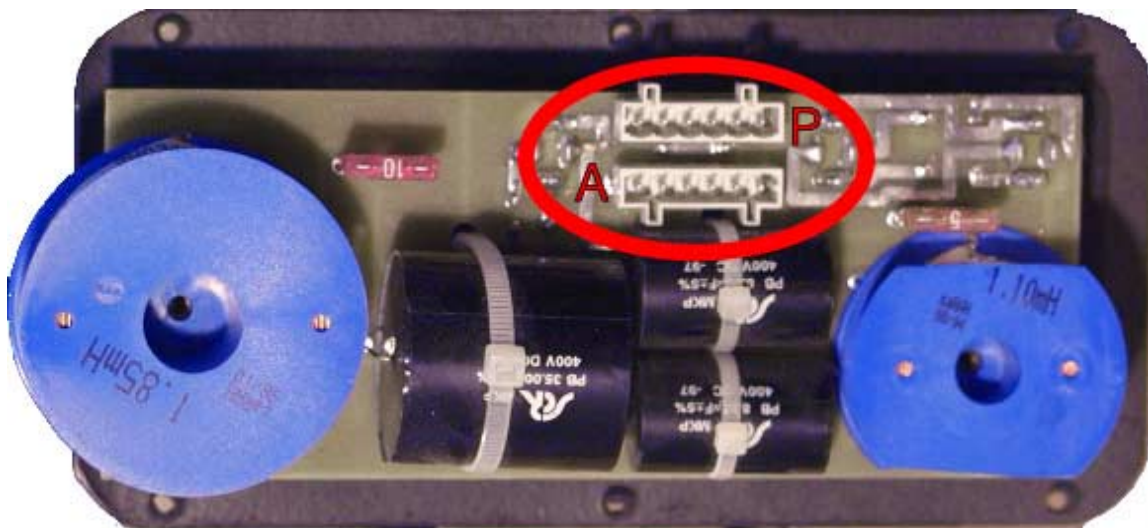
For stage monitors the required coverage is always wider when performers are close to the wedge (above the horn axis) than when they move away from it (below the horn axis). For floor monitor use the horn must be rotated with its "wide" dispersion side directed towards the top of the cabinet (as shown 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

Active / Passive configuration (PS15 Only)

Switching from passive (factory setting) to active requires modifications to both the PS15 cabinet and TDcontroller. (For the latter see « Active / Passive switching » page 21).

For the PS15, unscrew the connector 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 5.



Sub bass Use (optional)



General Recommendations

The Sub bass section of the TDcontroller is monophonic (the Left and Right channels are summed at the input of the Controller). In a Stereo sub bass 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. The PS15 TDcontroller MK2 also allows this setting to be made internally by moving jumper 4 (J4) to the "A" position. (Seeon page 22)

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 sub bass units.

Impedance Compensation Network (ICN) (PS15 Only)



The ICN feature is included in PS15 cabinets since PS15 serial number 23853. Its main function is to smooth the impedance curve of the HF driver, thus improving the passive crossover. The direct result of this circuit is to flatten the un-equalised response curve (without TDcontroller) and to reduce distortion in the 1kHz-2kHz area. For compatibility with older TDcontrollers see section « PS15TD MK2: Compatibility with former PS15TD, LS1000 & PS15 cabinets » page 15. Please also note that this network is available as a kit to upgrade older cabinets (and TDcontrollers).

Accessories

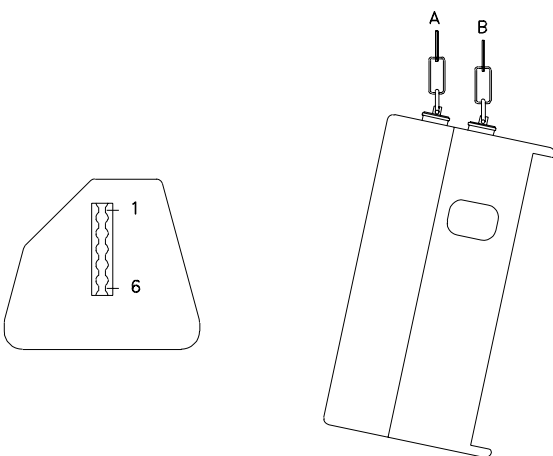
SAFETY recommendation for all accessories

- 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 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

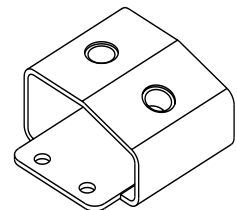
The back and the bottom of the PS10 is equipped with internal anchor points (M8 metric) to the Omnimount® 100 Series spacing standard. This is particularly convenient when cabinets must be installed permanently in a horizontal or vertical position. To remove the original screws a N°4 metric Allen key/TORX25 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

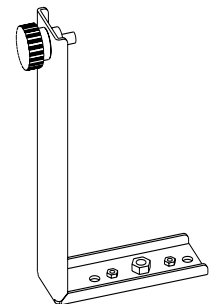
This accessory is designed to be mounted directly onto the PS8 cabinet surface. It provides 2 M10 captive nuts that allow the following accessories to be fitted: (not supplied in this kit)

- Standard lighting hook/CLAMP
- M10 lifting eye bolt
- DIN Pivot (TV spigot)



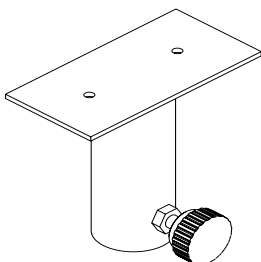
FS0081-002

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 (Ø35mm). It can be used along with other accessories or it can be fitted directly to the cabinet.

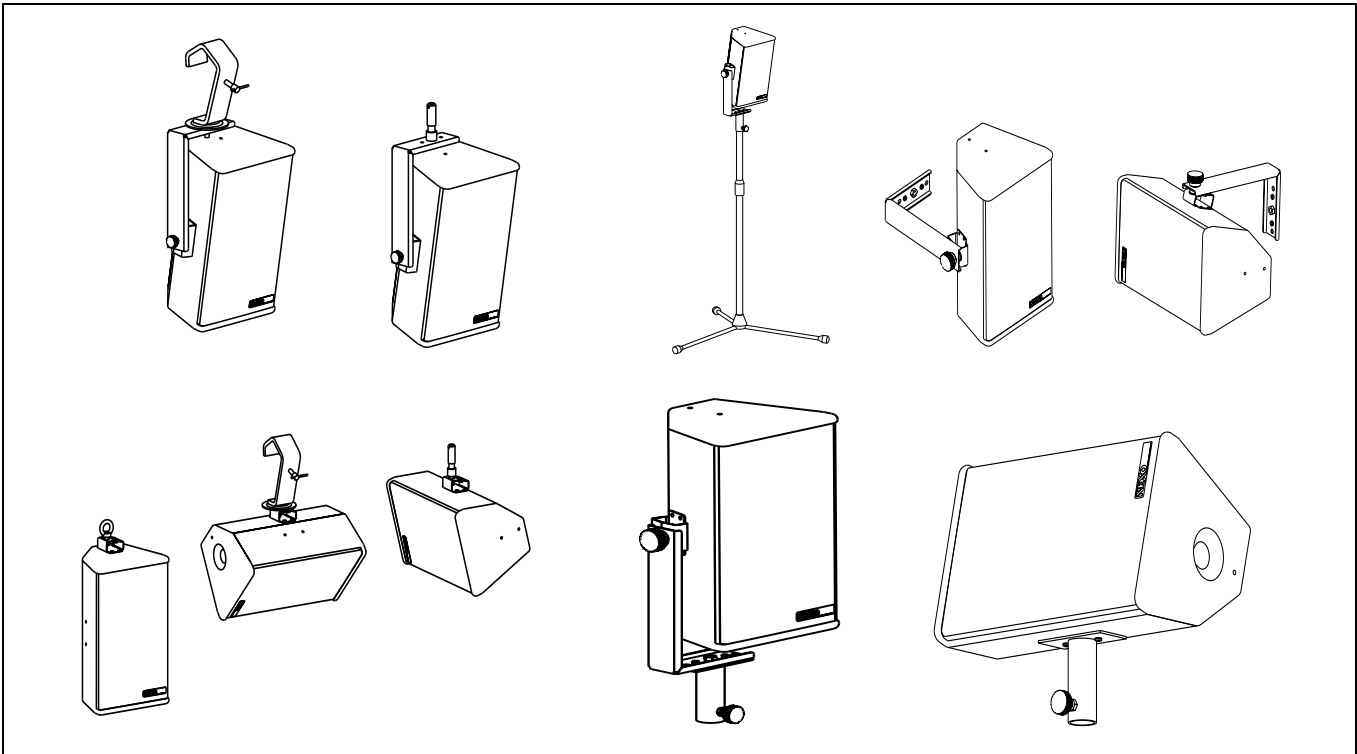


SA0081-001

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.



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.

TDcontroller USER GUIDE



This section describes the Analogue TDcontroller PS8TD, PS10, and PS15MK2. For information concerning the NX241 Digital TDcontroller, please refer to the NX241 Operating Manual.

Read before use

The PS TDcontroller is designed to be used with PS and LSub speaker cabinets. Its main functions are:

- To optimize the response of the system
- When operating with a Sub-bass system (optional), splitting the stereo (2 channel) signal into 2 frequency bands (PS main system and LSub Sub-bass system)
- When operating in active configuration (PS15 only), splitting the mono (single channel) signal into 3 frequency bands (SUB, LF & HF)
- Active protection of the cabinets by dynamic audio signal processing (Temperature and Displacement servo control)
- Reduction of amplifier overload (Peak limiter function)

PS TDcontrollers also feature:

- Stereo operation (2 independent channels) for the main system
- Global switchable output level according to amplifier gain
- Individual gain control for each channel (PS15 only)
- Adjustable level on the Sub-bass channel
- Balanced input and output stages (High CMRR input stage and High current drive output on PS15TD)
- User array LF EQ (PS15TD only)
- Enhanced protection facility for additional safety margin when the cabinet is subjected to extended periods of overload.
- Fallback servo control mode prevents protection loss when sense lines are accidentally disconnected

(NB: on PS10TD, this feature is provided only after serial number 361 and not at all on PS15TD MKII).

- Compensation of power compression effects on the system response curve..

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

PS15TD MK2: Compatibility with former PS15TD, LS1000 & PS15 cabinets

PS15TD MK2 with PS15 cabinet without Impedance Compensation Network (ICN)

Internal jumpers J1 & J6 in the TDMK2 provide total compatibility for a PS15 cabinet with or without ICN (shipped with PS15 since sn 23853).

The PS15TDcontroller MK2 is factory set to be used with ICN. Using old PS15 cabinets with the TDMK2 without changing internal jumpers (see page 21) will result in a boost of 3dB at 1400Hz and a decrease in sound quality: if the TDcontroller cannot be changed, a temporary solution would be to apply an inverse EQ before the TDcontroller.

PS15TD MK2 with LS1000 cabinet

We strongly advise that you do NOT use LS1000 before serial number 560 with the PS15TD MK2. The driver in early model LS1000s cannot withstand the amount of energy provided by the new electrical cross-over.

LS1000 above serial number 560 are equipped with the new 18" NEXO driver and with these units it is possible to use the TDcontroller MK2. Keep in mind that the cross-over is not tuned for the LS1000 architecture and sound quality will be not be as good as with the LS1200.

PS15 cabinet with ICN used with earlier PS15TD

As the non-equalized response of the PS15 cabinet is flattest with the ICN, the use of an old PS15TD (with higher equalization) will result in a cut of 3dB at 1400Hz.

A modification can be made on early PS15TDs (contact your NEXO dealer). Disconnecting the ICN (near the HF horn) is also possible (in that case your cabinet is identical to earlier models before sn 23853).

LS1200 used with former PS15TD

In this case, the LS1200 will be under driven. The crossover will not match the cabinet architecture. No sound improvement (vs. LS1000) should be expected. A modification can be made to your old PS15TD (contact your NEXO dealer), but it will be no longer compatible with the LS1000.

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 23.

Turning the LSub channel on (On) (Overlap / Crossover for PS15)



For use with the PS8 & PS10 cabinets, pushing the LSub button turns the Sub-bass channel On (Sub L + R output), which feeds the amplifier(s) driving the LSub cabinet(s). Signals below 120 Hz are then reassigned after Left + Right summation to this output, while the main Left & Right channels are high-pass filtered at the same frequency. When not using Subs, this switch must be released for proper operation of the PS cabinet. A red LED indicates that the function is in operation (button pushed in).

In the case of the PS15 MKII TD controller, this 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 although the older PS15TD operates as the PS8/PS10 units described above). In the « Overlap » position, the PS15 is exploited to its maximum capability. This position should be used if the system is being used without a LS1200. It can also be used with the LS1200; In this case, there will be a boost in the crossover area. The « Cross over » position is generally recommended when using the LS1200.

Adjusting the LSub level (Sub Level)

The potentiometer adjusts the level of the Sub-bass channel, a range of 12 dB allows a variety of configurations and application conditions to be accommodated. Icons show the 2 standard positions; 1 LSub for 1 PS cabinet, and 1 LSub for 2 coupled PS cabinets. Center position of the knob is calibrated for 1 LSub used with 2 distant PS.



Amplifier control (Sense & Pk)

The green Sense 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 red Peak LED indicates that the Peak limiter is acting, reducing excessive peak voltage or levels capable of overloading the channel amplifier.

Protection indicator

- The yellow VLF LED indicates that temperature or displacement protection for the LSub are engaged on the Sub-bass channel. On the PS8TDcontroller only the displacement protection is monitored.
- On each side of the PS main system window, yellow LF and HF LEDs indicate when protection has been activated (temperature or displacement control) for either the LF or the HF driver respectively on the Left or Right channel. On the PS8TDcontroller the LED indicate the displacement and temperature protection of the bass driver only.



PS15 Gain control (PS15TD only)



Two 12 dB range trimmers are provided to set the gain of L&R (HF & LF in active mode) channels. This adjustment can be useful in active mode where it is sometimes necessary to correct the gain difference of amplifiers which have different power and constant sensitivity. The factory position is in the middle (detent), which correspond to 0 dB gain.

Enhanced protection trimmer (Protect)

The embedded trimmer located on the right side of the front panel (outside the window) is used to lower the threshold of the protection system. When turned fully to the left (marked Std), speaker protection is set for normal operation. When turned fully clockwise (marked Max), protection is increased; e.g. this setting should be used when the system is operating under badly controlled conditions (eg. When amplifier gain are not known or sense lines are not connected...). Middle positions of the trimmer can also be used and are recommended in cases where extended periods of overload (e.g. in some discotheque applications) are expected.



Peak Limiter adjustments (PS15TD only)

The PS15TD MK2 features three independent peak limiter trims, which allows the peak limiter to be set to limit the maximum power of the amp (without affecting the protection threshold as implemented in the earlier version of the PS15TD). The



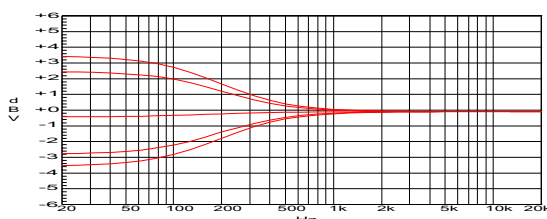
peak limiter has no real cabinet protection functions; it must be tuned to avoid overdriving the amp that in turn can generate obvious clipping noise and very low frequencies (caused by the modulation of the power supply rails).

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 Ω load).

Active & Power LED (PS15TD MKII only)

At the left side of the TDcontroller a green LED indicates the unit is powered, and a red one indicates the active mode is selected.

LF Eq. (PS15TD MKII only)



This control increases (or decreases) of the Low Frequencies (on both PS and LSub). It acts similar to a shelving filter with a range of +/- 3 dB

Rear Panel



Audio Inputs



The audio inputs are two 3-pin female XLR connectors located in the area labeled Audio IN, L and R being the left and right channels respectively. When using the active mode on the PS15TD only the Left channel XLR connector is used. 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 PS TDcontroller being neutral regarding the polarity of the signal.

In cases where an unbalanced source is connected to the inputs, the connections should be made as follows to preserve signal polarity:

- If the amplifiers connected to the outputs of the PS TDcontroller are wired pin 3 hot, connect the hot pin of the source to pin 3 of the Audio input XLR of the PS TDcontroller.
- If the amplifiers are wired pin 2 hot, connect the hot pin of the source to pin 2 of the Audio input XLR.

In both cases the unused signal pin (2 or 3 respectively) should be linked to pin 1 (grounded).

Audio Outputs

The audio outputs are the three 3-pin male XLRs located in the area labeled Audio OUT. The channel corresponding to each output connector is identified by the labels Syst L (left channel), Syst R (right channel), and Sub L+R (mono Sub-bass).

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).

Where an amplifier with unbalanced inputs is used, the connections should be made as follows :

- Where the source connected to the PS TDcontroller input is pin 3 hot, connect the hot pin of the amplifier to pin 3 of the PS TDcontroller XLR output connector and the amplifier ground to pin 2.
- Where the source is wired pin 2 hot, connect the hot pin of the amplifier input to pin 2 of the XLR output connector, and the amplifier ground to pin 3.
- Leave pin 1 of the output XLR unconnected.

This wiring method avoids any loss of output level, provided that the ground of the PS TDcontroller stays floating relative to that of the amplifier -thus care should be taken with regard to the Earth Lift switch when it is depressed: the respective signal grounds could possibly be linked together via the mains earth).

Output Level Switch

The 3 position output level switch has two main purposes :

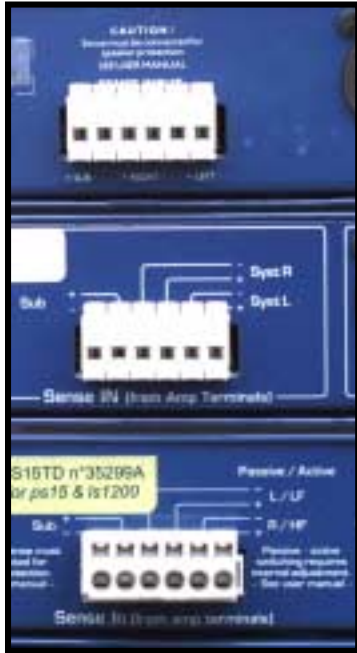
1. Once the sense lines are connected, this switch is only used to match the processor gain to the amplifier gain for optimum signal to noise ratio. Having selected the appropriate output level, the signal to noise ratio will be preserved whatever the gain of the amplifier (for a broader explanation of this please refer to page 28).
2. If the sense lines are disconnected, the TDcontroller is operating in fall back mode (Does not apply to PS15 MKII). In this case, **selecting the proper switch setting is absolutely essential to ensure the correct operation of the protection circuits.** For the PS8TD (labels -12dB -6dB 0dB) an attenuation of 12dB should be made for 38dB amplifier gain and 6dB for 32dB amplifier gain. (the 0dB position corresponds to 26dB amplifier gain)

The three gain values available are 26, 32 or 38 dB and correspond to the positions left, middle and right of the switch respectively. If the effective gain of the amplifiers doesn't correspond to any of the three positions the closest should be selected. In case of doubt, the lesser value should be chosen.



For the PS15TD The three gain values available are +6dB, 0 & -6dB. For minimum noise floor the -6dB setting should be chosen, for maximum headroom the +6dB position should be used.

Sense inputs



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

Input sense connection is strongly recommended for proper operation of the servo-control system. On PS15TDcontroller MKII (and PS10 TDcontrollers with serial numbers before #360) which do not have fall-back mode, the cabinets will NOT BE PROTECTED if the sense lines are unconnected.

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 (Syst L)	+ (red)	⇒	pin 1 (figure)
	- (black)	⇒	pin 2
PS Right (Syst R)	+ (red)	⇒	pin 3
	- (black)	⇒	pin 4
LSub (Sub)	+ (red)	⇒	pin 5
	- (black)	⇒	pin 6

NB : The PS TDcontroller is insensitive to the polarity of the wiring of the inputs, contrary to some other NEXO Controllers. It is highly recommended that the user read the all of the information provided below regarding the wiring of Sense lines (0.0.0 : Recommendations for wiring the Sense lines).

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.

Following functions concern PS15TD MK2 only

Voltage selector (PS15)

According to CEI65 and UL1419 norms, an external voltage selector is provided at the back of the unit. It will allow the controller to work with either normalized voltage (230V or 115V).

WARNING : Changing the voltage selector requires changing the fuse.

Fuse holder (PS15)

When necessary, the fuse should be replaced by a fuse of the same rating

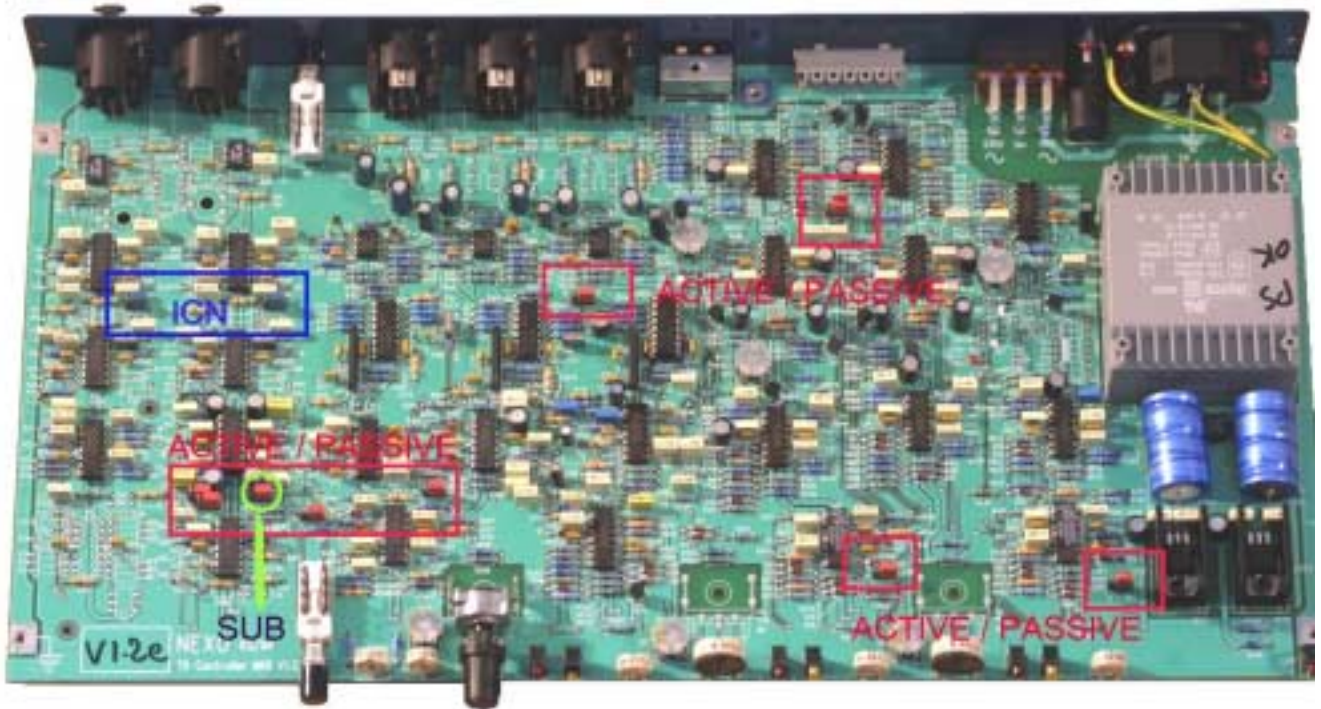
- for 230V : T100mAL250V
- for 115V : T200mAL250V

Mains Socket (PS15)

WARNING : This appliance must be earthed.

The socket is compatible with mains supply flexible cords which comply with IEC Publication 227.

Functions requiring the opening of the TDcontroller



Active / Passive switching

The switching between active mode and passive mode is made by 9 RED jumpers, designated J3-J4-J5-J8-J9-J10-J11-J12-J13.

All 9 jumpers must always be in the same position; right side for passive mode (label « P », left side for active mode (label « A »). **Incorrect jumper selection may damage your speakers and impair sound quality !**

ICN jumpers

If your PS15 cabinet is equipped with the Impedance Compensation Network (ICN) -since sn 23853, the blue Jumpers J1 & J6 must be in the « P » position (right side).

If you are using this TDcontroller with a PS15 cabinet without an ICN, the ICN jumpers must be set to the « A » position (left side). If not, a boost of 3dB at 1400Hz will result, affecting the sound quality of your 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 J4 jumper to the left position (« A »), the sub channel will only use the Right input (with 6dB gain to keep the same sub level when the mono summation is enabled)

Setting-Up Advice

Recommendations for wiring the Sense lines

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

If the Controller is located remotely - at the mixing position - a shielded cable is recommended, without using the shield as a conductor.

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 Controller, it can be cured by short-circuiting the terminals of the inactive sense line.

In all cases, it is strongly advised to protect the amplifiers from short-circuits in the sense lines. It is recommended that a 1 kOhm resistor with a power rating of at least three watts be inserted in series with one of the sense line cables as close as possible to the output terminals of the amps.

Connecting the audio outputs

The output stages can drive several amplifiers in parallel ; however it is not advisable to work with loads of less than 1 kOhm. 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 10 kOhm as the minimum value possible), ten channels in parallel per output is a sensible maximum.

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 Sub-bass 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 cross-over 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 normally intended to work with amplifier return signals present at the Sense inputs (monitored by front panel LEDs).

(WARNING : the following paragraph does not apply to PS15TD MKII & PS10 TDcontrollers with serial numbers below #361)

However, when no signal is detected on a Sense line, an internal signal is automatically substituted for the actual amplifier signal at the input of the servo control path. This fall-back operation mode allows protection to be maintained even when Sense lines are accidentally disconnected. It is emphasized that this fall-back operation mode does not perform with the same accuracy and reliability as actual feedback, and is intended to maintain some protection in accidental situations only.

VCA's and VCEQs

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

- One operates on the whole frequency range (wide band VCA).
- The other element works selectively as a dynamic equalizer (LF-VCEQ).

Depending on the nature and origin of the servo signals, either one or the 2 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. On PS15TD and on PS10TD (serial number above 868), power compression is also simulated by lowering the high frequencies when temperature protection is acting on the bass loudspeaker.

Dynamic control

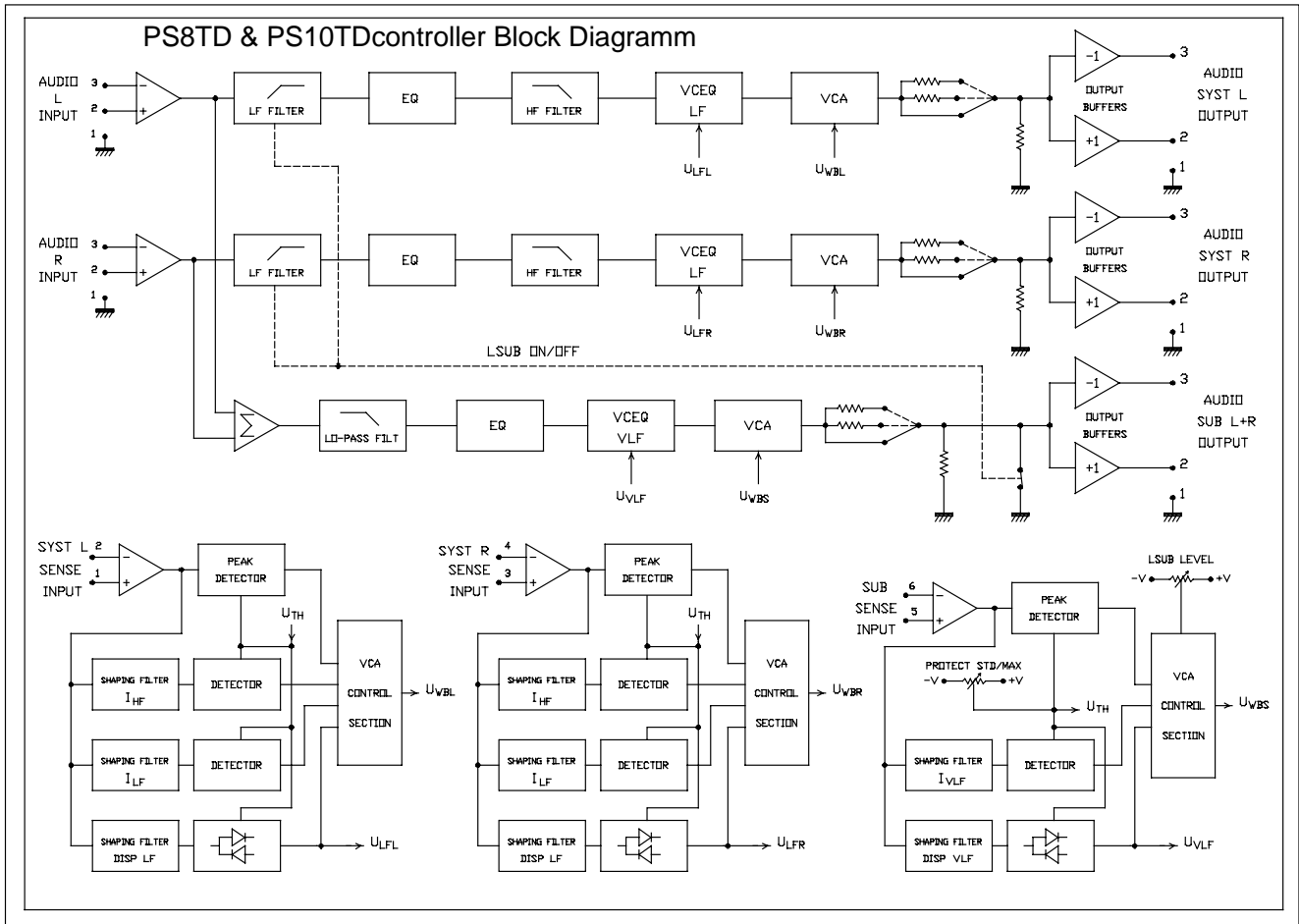
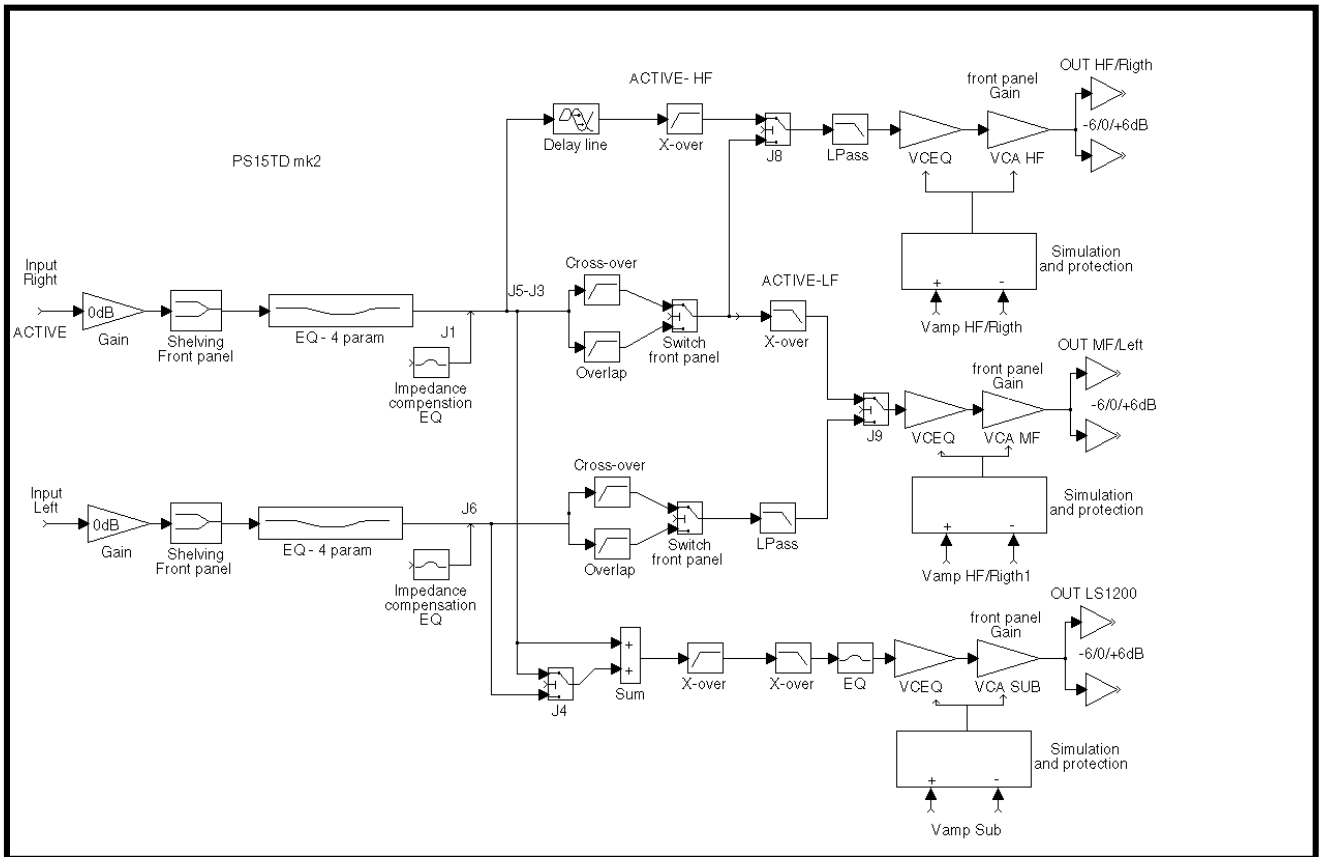
To reduce audible « pumping » effects due to very long time constants of temperature detection signals, an alternate integration is also processed with a shorter time constant. Whilst anticipating the temperature protection and reducing its unwanted effects, action of this signal also improves dynamics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

Electronic block diagram



AMPLIFIERS

PS8Amp & PS10Amp



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 23
- 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 PSAmplifiers.

The L&R link switch simplifies Mono wiring when independent PSAmplifier 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 PS10 Stereo channels are assigned to poles 2+ and 2- on the L & R Speakons. A single PS10 LED lights up on each Stereo channel.

The LSub 500 channel is Mono L+R summed and assigned in parallel to poles 1+ and 1- of both Speakons. The LS500 LED lights up.



- Sub Off = 2 amplifier channels:

The two PS10 Stereo channels are assigned to poles 2+ and 2- on the L & R Speakons. Two PS10 LEDs are lighted on each channel. Poles 1+ and 1- of both Speakons are disconnected. The LS500 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 PS10s in Stereo.

1 x 850 Watts into 4 Ohm channel feeds the LSub 500 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 relative level of the LSub relative to the PS when Sub is On.

It is independent of overall Level control.



Fuses and Mains

Mains Voltage selection, safety fuses and Earth-Lift configuration are located under the safety cover on the front panel.

The mains power cable can be located on the front or on the back of the PS10Amp. 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 ± 1 dB 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 V_{in} is not important (1V is rather convenient), \pm taking care not to choose a value that will overdrive the amp input!

3/ Measure the Amplitude Volt at the output of the amp.

$$\text{Gain} = 20 * \text{LOG}_{10}(V_{out}/V_{in})$$

Some examples:

Vin	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.

PS8, PS8TD & LS400 : SPECIFICATIONS, CURVES & DIAGRAMS

SYSTEM SPECIFICATIONS	PS8 with PS8 TDcontroller	LSub 400 with PS8 TDcontroller
Frequency Response [a]	69 Hz - 19 kHz \pm 3dB	43 Hz - 120 Hz \pm 3dB
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 NX241 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 [MLF]	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.

PRODUCT FEATURES	PS8 TDController
Audio Inputs	Two L&R Audio inputs. Electronically balanced, 36 kOhm. Two XLR-3F connectors.
Sense Inputs	Three Amplifier Sense Inputs (PS8 L&R, LS400). 150 kOhm. 6 Pole Removable Strip Terminal.
Audio Outputs	Two L&R PS8 Audio outputs. Electronically balanced, 50 Ohm. Two XLR-3M. One Mono (L+R) LS400 Audio output. Electronically balanced, 50 Ohm. One XLR-3M.
Specifications	Output Level : +20 dBm Max. +19dBm Max on 1kOhm Noise : -88 dBm (22 Hz - 22 kHz, UnWeighted). THD+N : < 0.03% Typ. 0.05 Max for +18dBm Output
Controls & Indicators	Std/Max Protection Trimmer. Gain switch (back panel), 3 positions for Amps with Gain : -12 / -6 / 0 dB. Sub On switch & Sub Gain Control. Speaker Protect LED's. Amp Sense & Peak LED's.
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	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.

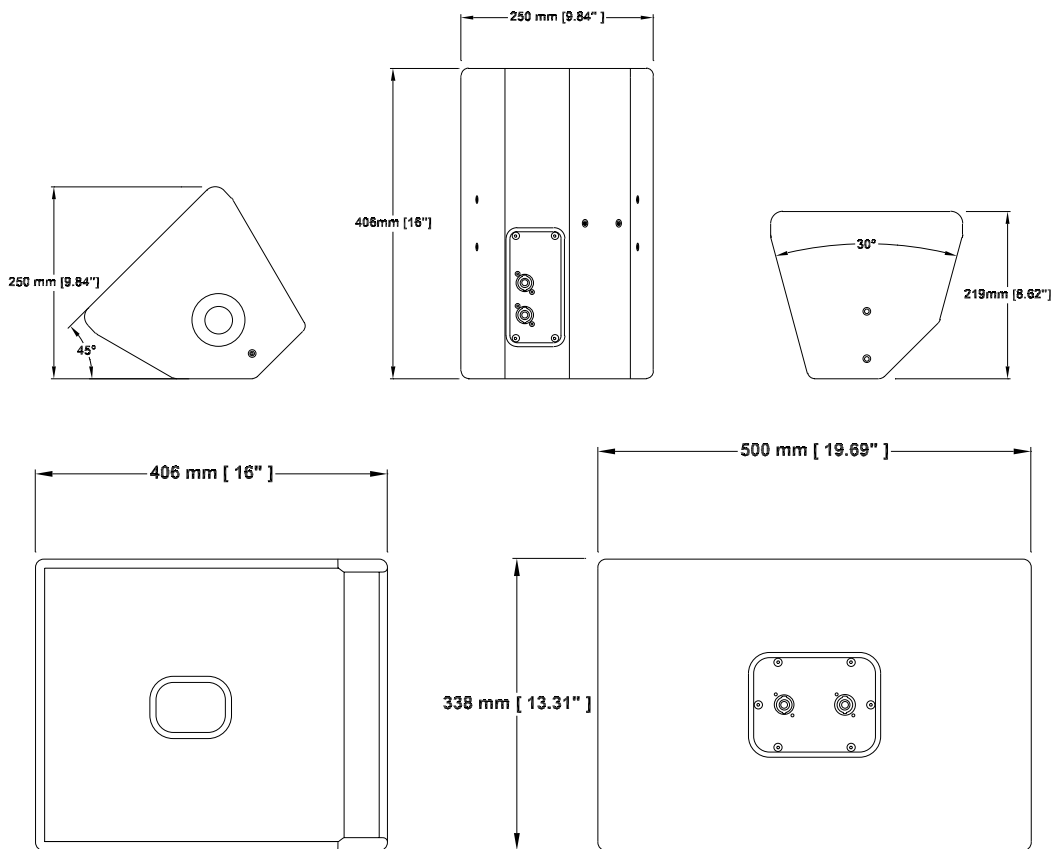
As part of a policy of continual improvement, NEXO reserves the right to change specifications without notice.

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

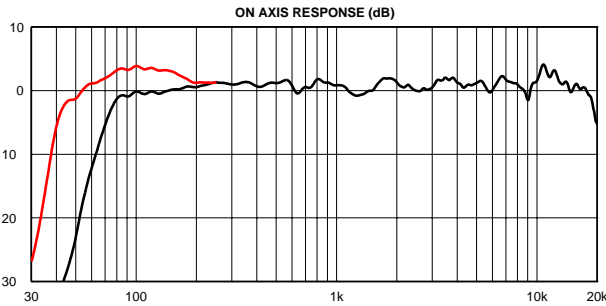
[b] Sensitivity & Peak SPL data : these will depend on spectral distribution and crest factor of program material. Measured with band limited Pink Noise. Nominal refers to Voice Decade (300 Hz - 3 kHz), Wideband to the specified ± 3 dB range. Data are for speaker + processor + recommended amplifier combinations.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

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

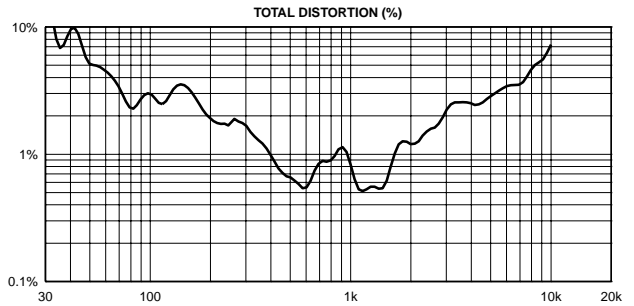
Dimensions



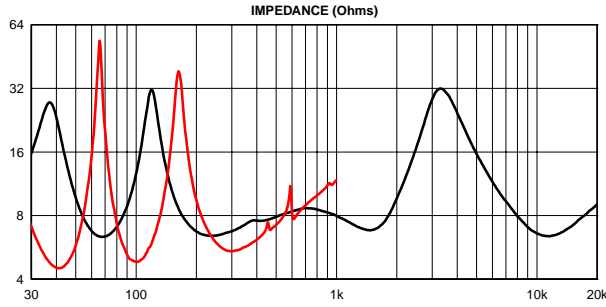
PS8 curves



On Axis Responses PS8 & PS8 + LS400.

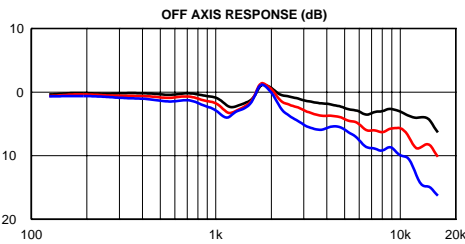


PS8+LS400 : THD for 110dB SPL @ 1m.

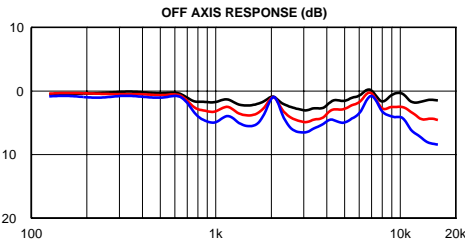


Impedances PS8 & LS400.

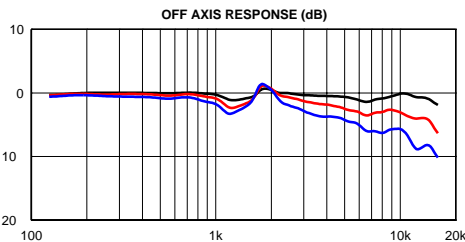
All measurements made with PS8TDcontroller.
 Response curves : Far Field, Halfspace below 200Hz, anechoic above 200Hz.
 Off axis response and polar plot : 1/3 octave averaged anechoic measurements.
 Vertical orientations refer to the cabinet in front of house configuration.
 Directivity index and factor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



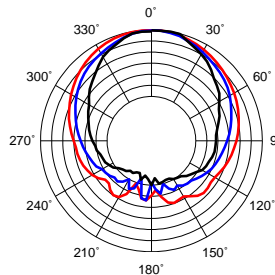
Horizontal Plane, Vertical Orientation +25°. 10°(black), 20°(Red), 30°(Blue) off axis response.



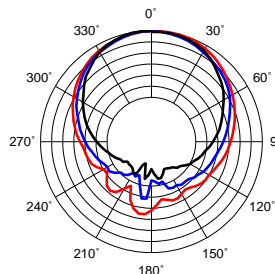
Horizontal Plane, Vertical Orientation 0°. 20°(black), 30°(Red), 40°(Blue) off axis response.



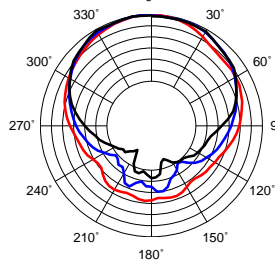
Horizontal Plane, Vertical Orientation -25°. 30°(black), 40°(Red), 50°(Blue) off axis response.



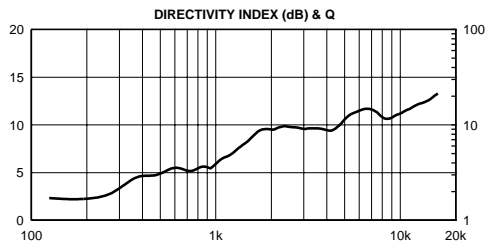
Horizontal polar plot (left). 5dB/division. Upper plot : vertical orientation +25°. Center plot : vertical orientation 0°. Lower plot : vertical orientation -25°.



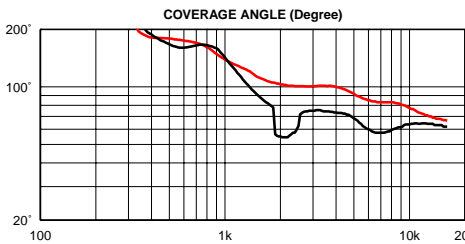
Above : vertical Polar plot. 5dB/division.



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



Directivity Index and Factor.



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

PS10, PS10TD & 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.	-

PRODUCT FEATURES	PS10 TDController
Audio Inputs	Two L&R Audio inputs. Electronically balanced, 36 kOhm. Two XLR-3F connectors.
Sense Inputs	Three Amplifier Sense Inputs (PS10 L&R, LS500). 150 kOhm. 6 Pole Removable Strip Terminal.
Audio Outputs	Two L&R PS10 Audio outputs. Electronically balanced, 50 Ohm. Two XLR-3M. One Mono (L+R) LS500 Audio output. Electronically balanced, 50 Ohm. One XLR-3M.
Specifications	Output Level : +20 dBm Max. +19dBm Max on 1kOhm Noise : -88 dBm (22 Hz - 22 kHz, UnWeighted). THD+N : < 0.03% Typ. 0.05 Max for +18dBm Output
Controls & Indicators	Std/Max Protection Trimmer. Gain switch (back panel), 3 positions for Amps with Gain : 26 / 32 / 38 dB. Sub On switch & Sub Gain Control. Speaker Protect LED's. Amp Sense & Peak LED's.
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

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

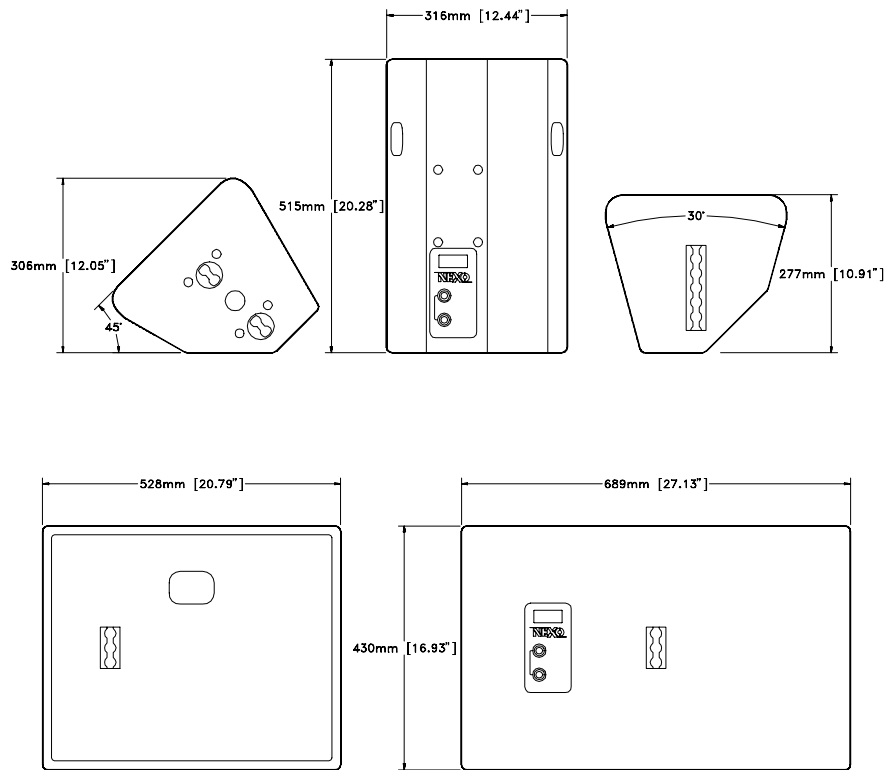
[a] Response curves & data : Anechoic Far Field for the PS10 + PS10TD. Half-Space Anechoic radiation for the LS500 + PS10TD.

[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 ± 3 dB range. Data are for speaker + processor + recommended amplifier combinations. Peak SPL is at clipping of recommended amplifier.

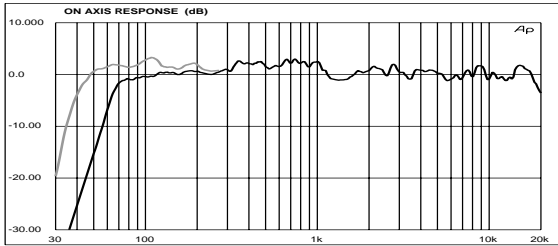
[c] Directivity curves & data : obtained by computer treatment on off axis response curves.

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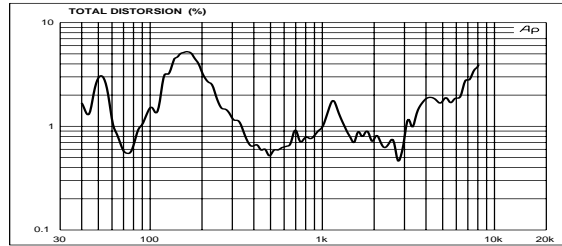
Dimensions



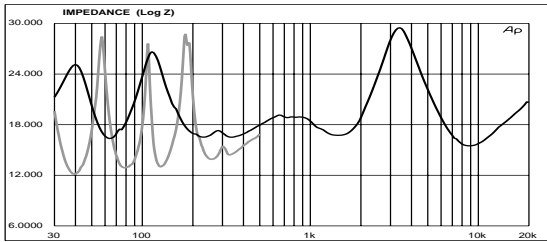
PS10 Curves



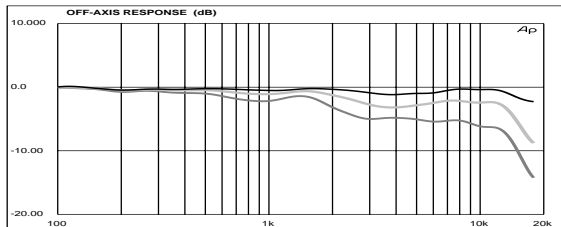
c 1 : On axis responses PS10 & PS10 + LS500



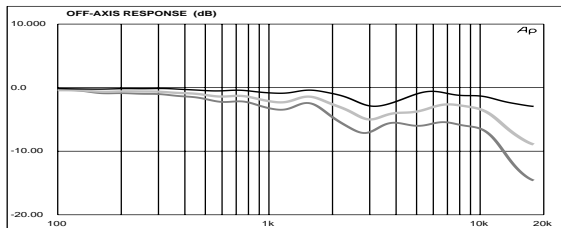
c 2 : PS10 + LS500 : THD for 110 dB SPL @ 1m.



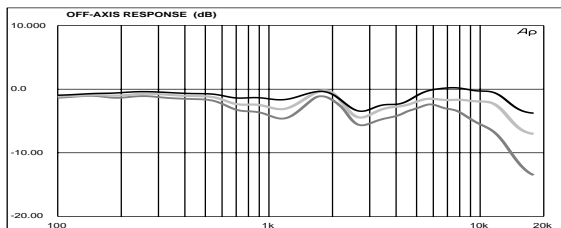
c 3 : Impedance PS10 and LS500



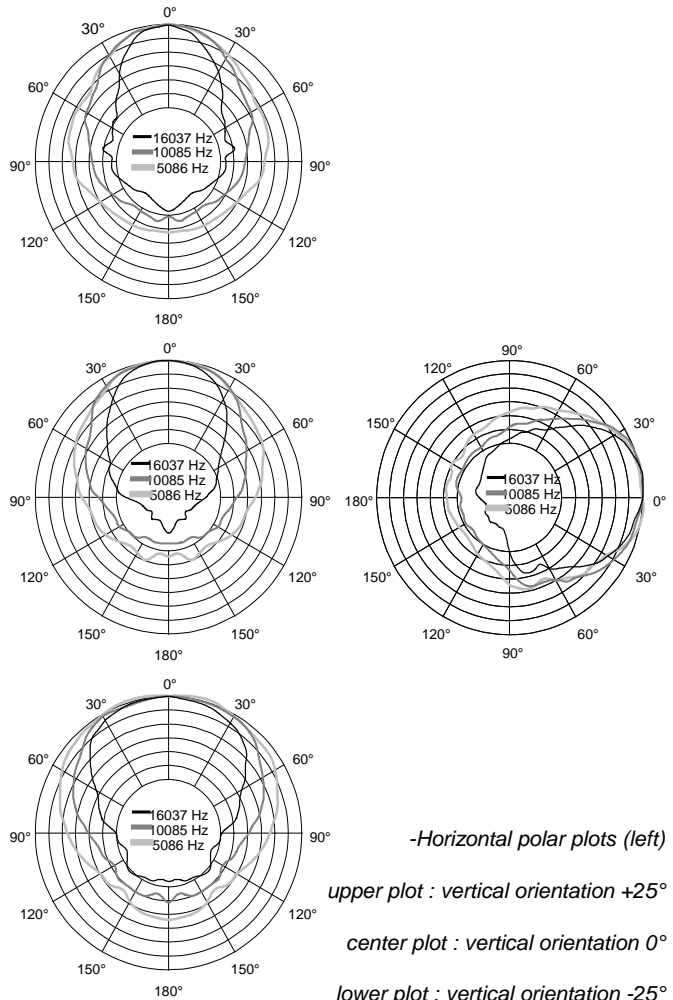
c 4 : Horizontal plane, vertical orientation +25°. 10°(black),20°(light),30°(dark) off axis response



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)

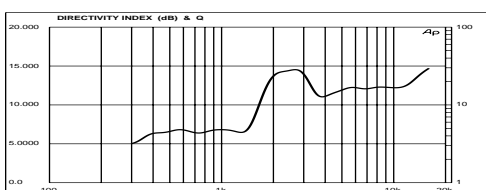
upper plot : vertical orientation +25°

center plot : vertical orientation 0°

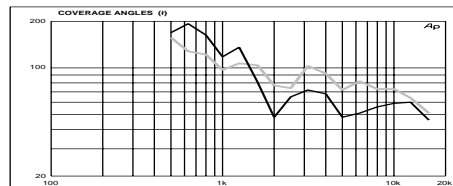
lower plot : vertical orientation -25°

-Vertical polar plot (right)

5 dB / div

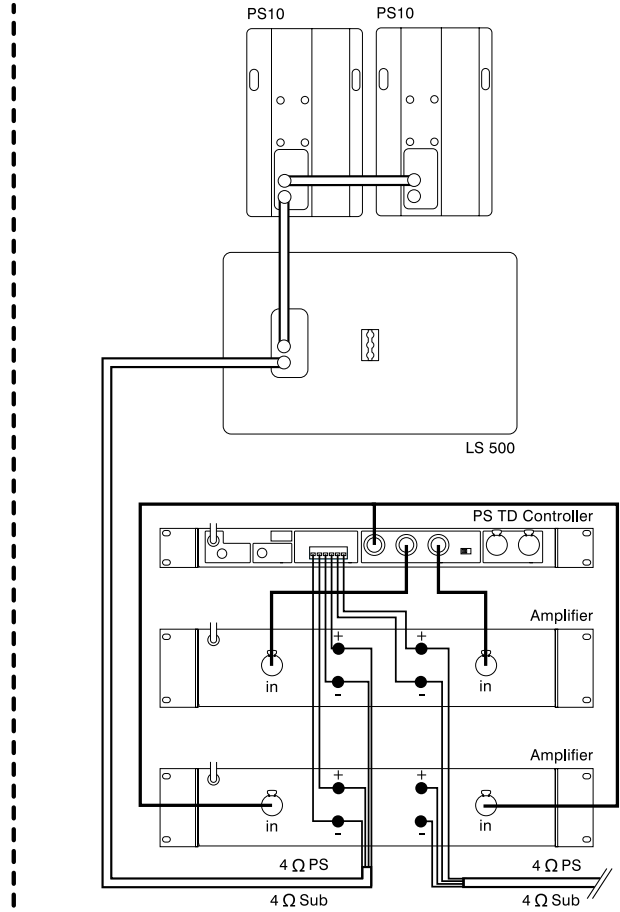
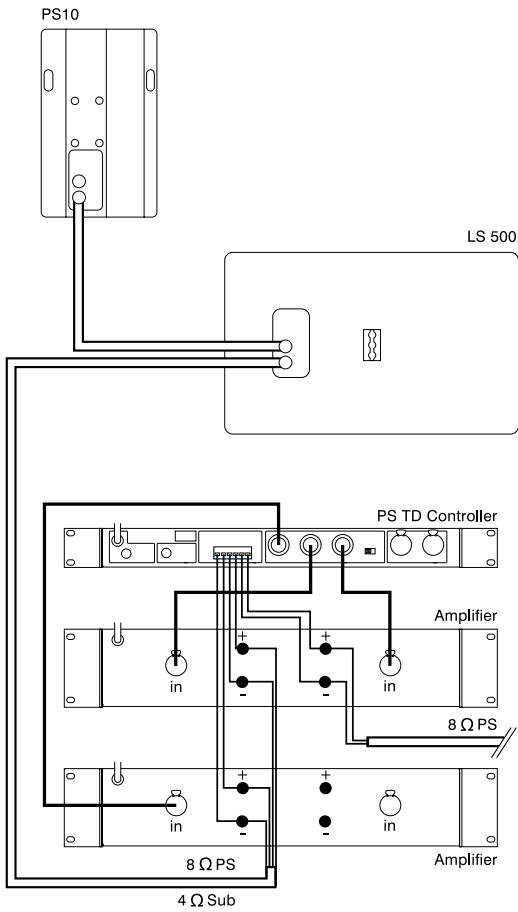


c 7 : Directivity index and factor.



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

Connection Diagrams



PS15, PS15TD MKII & LS1200 : SPECIFICATIONS, CURVES & DIAGRAMS

SYSTEM SPECIFICATIONS	PS15 with PS15 TDcontroller MK2	LSub 1200 with PS15 TDcontroller MK2
Frequency Response [a]	50 Hz - 18 kHz ± 3 dB	30 Hz - 120 Hz ± 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)	

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).	

PRODUCT FEATURES		PS15 TDcontroller MK2
Audio Inputs	Two L&R Audio inputs. Electronically balanced, 50 kOhm. Two XLR-3F connectors.	
Sense Inputs	Three Amplifier Sense Inputs (PS15 L&R, LS1200). 180 kOhm. on 6 Pole Removable Strip Terminal.	
Audio Outputs	Two L&R (HF&LF in active mode) PS15 Audio outputs. Electronically balanced, 50 Ohm. On two XLR-3M. One Mono (L+R) LS1200 Audio output. Electronically balanced, 50 Ohm.	
Specifications	Output Level : +28 dBu Max on 600Ω - 1nF load. Noise floor (22 Hz - 22 kHz, Unweighted, output level 0dB) L&R: -90 dBm, Sub : -70 dBm. THD+N : < 0.03% Typ. 0.05% Max. for +20 dBm Output	
Controls & Indicators	Front panel : Overlap / Crossover switch, Speaker Protect LED's, Amp Sense & Peak LED's, Bass EQ trimmers (+/- 3dB). 3 Peak limiters adj. trimmers, one gain control trimmer per channel. Back panel : Gain switch -6/0/+6 dB. Internal : 3 protection trimmers. Switching Active/Passive.	
Power Supply	115/230 Volts (switch on back panel), 50/60 Hz.	Earth-Lift (switch on back panel)
Dimensions & Weight	1U 19" Rack. 210 mm (8.5") Depth. 3.3 kg 7.3 (Lb.) net	

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.

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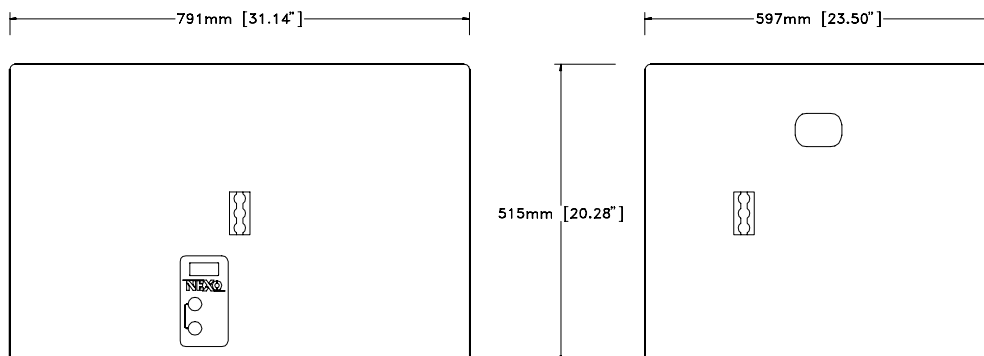
[a] Response curves & data : Anechoic Far Field for the PS15 + PS15TD. Half-Space Anechoic radiation for the LS1000 + PS15TD.

[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.

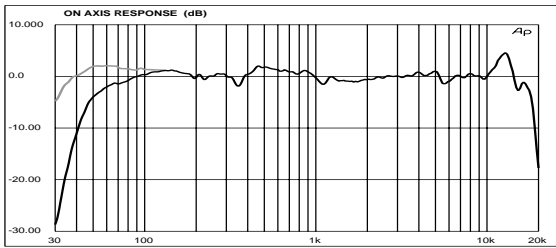
[c] Directivity curves & data : obtained by computer treatment on off axis response curves.

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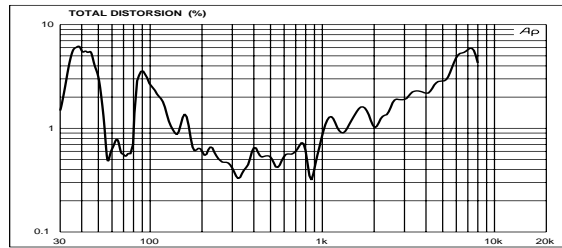
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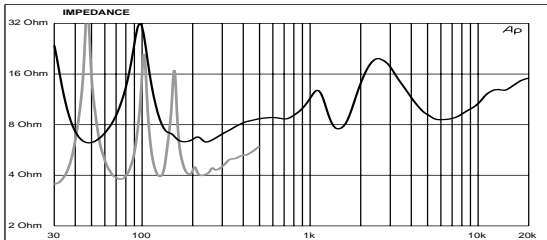
PS15 : Curves



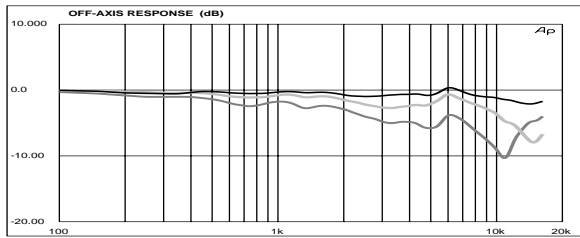
c 9 : On axis responses PS15 & PS15 + LS1000



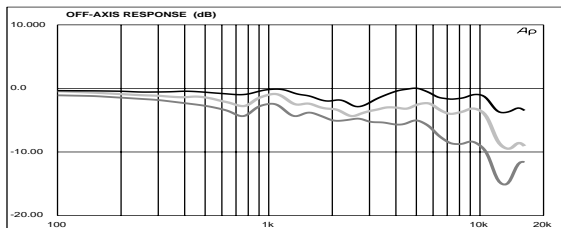
c 10 : PS15 + LS1000 : THD for 115 dB SPL @ 1m.



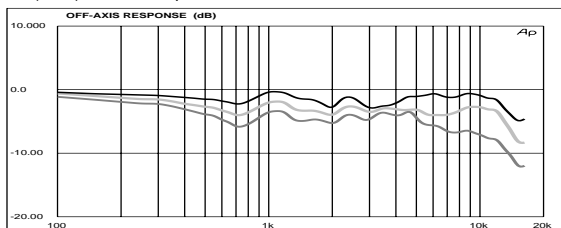
c 11 : Impedance PS15 and LS1000



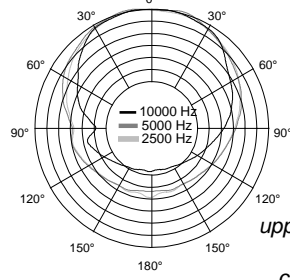
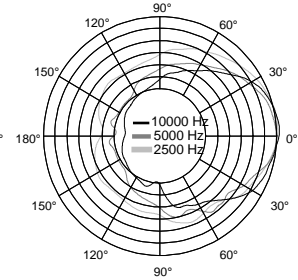
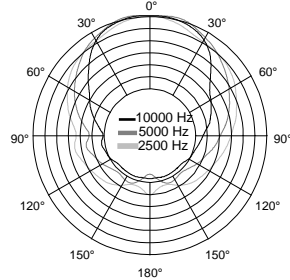
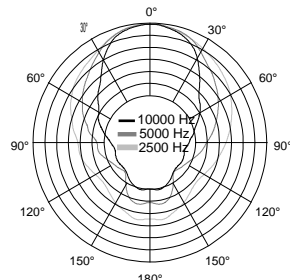
c 12 : Horizontal plane, vertical orientation +25°. 10°(black),20°(light), 30°(dark) off axis response



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)

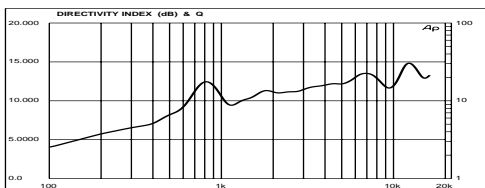
upper plot : vertical orientation +25°

center plot : vertical orientation 0°

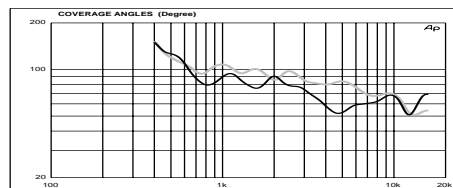
lower plot : vertical orientation -25°

-Vertical polar plot (right)

5 dB / div

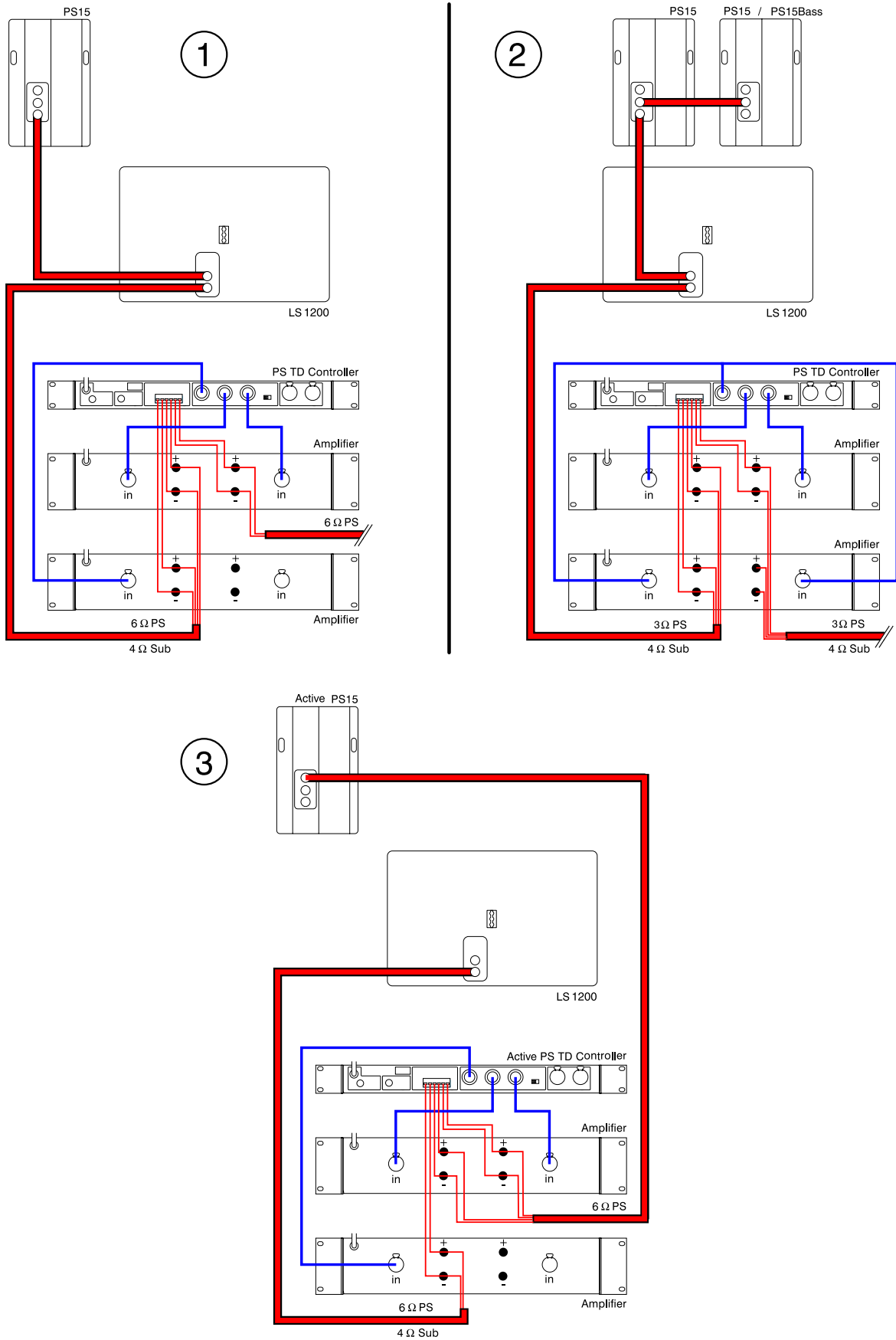


c 15 : Directivity index and factor



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

Connection Diagrams



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