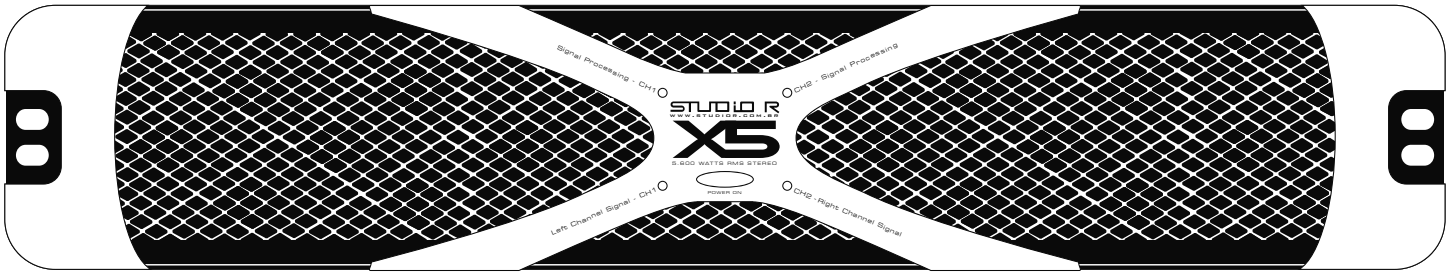
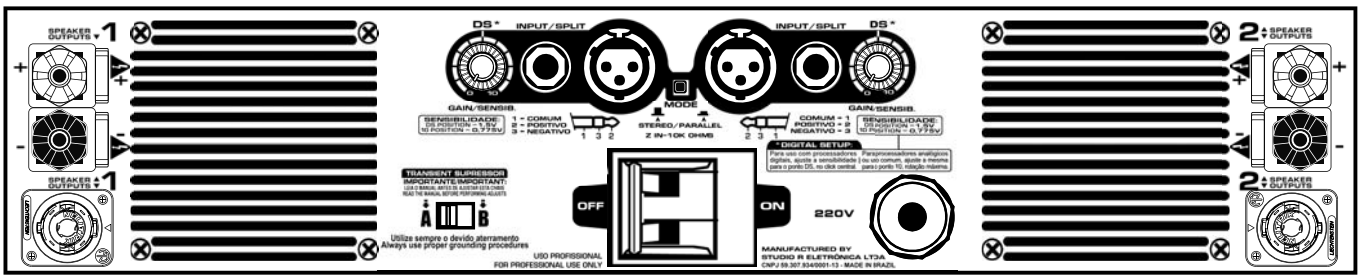
OWNER'S MANUAL

STUDIO R

X SERIES





EURO VERSION / REGULAR VERSION

SOFT START

4X4 FOUR SPEAKERS PER CHANNEL

SOFT CLIP

MODELS X1,X3,XD,X5,X8 and X12.

01/2009 - REV#5 -EN.

INTRODUCTION:

Congratulations for purchasing a **STUDIO R X SERIES** amplifier!
Our amplifiers are designed for many years of reliable operation at fixed or movable facilities, under the strictest weather conditions.

The Studio R 3-year warranty **(valid for Brazil. Check with your dealer for local warranty):**
A regular warranty usually covers the free repair of a product every time this fails during a certain initial period of its lifetime. This procedure, although free of charge, solves the problem of those components which have aged prematurely on the product in a very costly and burdensome way for the customer. Many hours are lost with the inoperative system and its transportation.

Our concern with the warranty covering out products has never been that of merely repair them promptly every time they present a fault, but also to prevent faults for a long time during their lifetimes.

Studio R exclusive Burn-in:
Every **Studio R** amplifier is in-factory tested for three 3-hour cycles at full power in a high-temperature oven. It is cooled and tested again at every interval. This process is the only internationally proven way of finding components of a system which could deteriorate prematurely within the equipment lifetime.

Our current fault rate is 2 out of every 1000 devices produced, with a 5-year time of regular use between two faults.
Such kind of product really allows you to amortize your investments safely and still make profit. This is why we say that your amplifier should operate almost seamlessly, while keeping the sonic quality and performance characterizing the **Studio R** products.

Although it is basically simple to operate, and having been designed to be endurable, **the improper use of this equipment can be dangerous!**

FOR YOUR SAFETY, READ THE SECTIONS ON IMPORTANT PRECAUTIONS ABOUT INPUT, OUTPUT, AND POWER CONNECTIONS.

DANGER: THE OUTPUTS OF THIS AMPLIFIER CAN PRODUCE LETHAL VOLTAGE LEVELS. NEVER MAKE CONNECTIONS WHILE THE DEVICE IS ON.
Wait for at least 1 minute after shutoff in order to carry out modifications in your connections.

WARNING: THIS EQUIPMENT IS CAPABLE OF PRODUCING HIGH SOUND PRESSURE LEVELS WHEN CONNECTED TO SPEAKERS AND PEAKER SETS.
The continued exposure to high sound pressure levels may cause the permanent loss of or a reduction in the hearing. Always work with your ears protected by appropriate attenuators.

1- IMPORTANT PRECAUTIONS: Read before operating your amplifier:

1.1 Keep this manual for future inquiries.
1.2 Follow all instructions printed on the chassis for the device proper operation.
1.3 Make sure the power line is compatible with your device voltage by checking on its back panel.
1.4 **Do not spill liquids in or on the apparatus.** Do not operate the apparatus exposed to rain or with some spilled liquid. Such practice is the main reason for lethal accidents caused by electric discharges.
1.5 **Do not block the air inlet or outlet**. Do not operate in locations liable to preventing the normal air flow.
1.6 Do not use this equipment in case any wire is stripped or fractured.
1.7 **It is recommended to keep your amplifier frame always connected to a grounding system; do this by means of the chassis bolt on the back panel.**
1.8 Do not activate the inputs with a power supply greater than the required for the amplifier at maximum output.
1.9 Never connect the output of a channel back to the input of another channel.
1.10 Do not connect the outputs in parallel with the outputs of any other amplifier.
1.11 Do not connect the outputs of this equipment with any other power supply, such as batteries or power line, either the equipment is ON or OFF.
1.12 **Do not connect any positive binding post to the ground.**
1.13 **Do not remove the covers.** On removing them you will be exposed to dangerous voltages. Inside the equipment there is no useful part for the user. In case any problem occurs, call your nearest technical assistance.

Technical support and information:
website: **www.studior.com.br** E-mail: **studior@studior.com.br**

2-INSTALLATION AND OPERATION:

2.1 Unpacking

Open the transportation packing carefully and check for any apparent damage. Prior to leaving the plant all **Studio R** amplifiers are fully tested and inspected and ought to reach you in perfect conditions. Should any damage be found on them, please notify the carrier immediately. Only a forwarding agent may request the carrier to take actions concerning the damage occurred during the transportation. Make sure to keep all packing for inspection. It might be a good idea to keep the packing even when your amplifier has come in perfect conditions. Whenever it has to be transported, use the original packing or rack standard CASE, with frontal bars.

2.2 Assembling

Your amplifier is designed to be assembled on a standard 19" CASE, with 02 units/rack. For a movable use, in addition to 4 holes for assembly on the front panel, also use the four holes located on the amplifier rear "grips". The ventilation on the apparatus rear portion and the front air outlet are essential for its proper performance. This system provides enough cooling for all load rates, assuming that the rack rear portion is open and unblocked. On racks with a closed rear portion, it is vital to install additional fans on same in such a way to pressurize them, ensuring a good air source for your amplifier internal fan.

2.3 Operating precautions.

Make sure the power line AC voltage is the appropriate for powering your X Series amplifier. The warranty does not cover damages resulting from using the device on the wrong voltage.

Prior to making any connection, both regarding input and output, make sure that the power switch is off. Even though the amplifier is fitted with overload protection as well as a Soft Start (silent activation), it is recommendable to always keep the gain controls low when turning it on. This operation will prevent any possible damages to the speakers should there be an excess signal on the inputs. Seek to acquire cables, connectors, and speaker of good quality and appropriate capacity. Check the wiring capacity table (Section 2.5) to determine the appropriate measures for different impedances and lengths of cables.

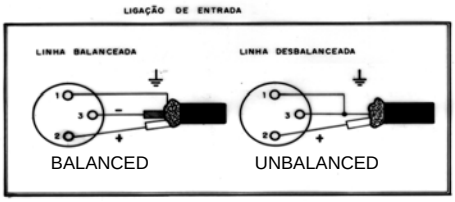
Most of the systems intermittences and faults occur due to defective wires and connectors.

Use quality connectors, wires, and welding technique to ensure seamless operations.

2.4 Connecting the inputs

The input/split connections are performed by means of two 3-pin, XLR-type and two "P10"- type connectors, located on the rear panel. The connection orientation is:

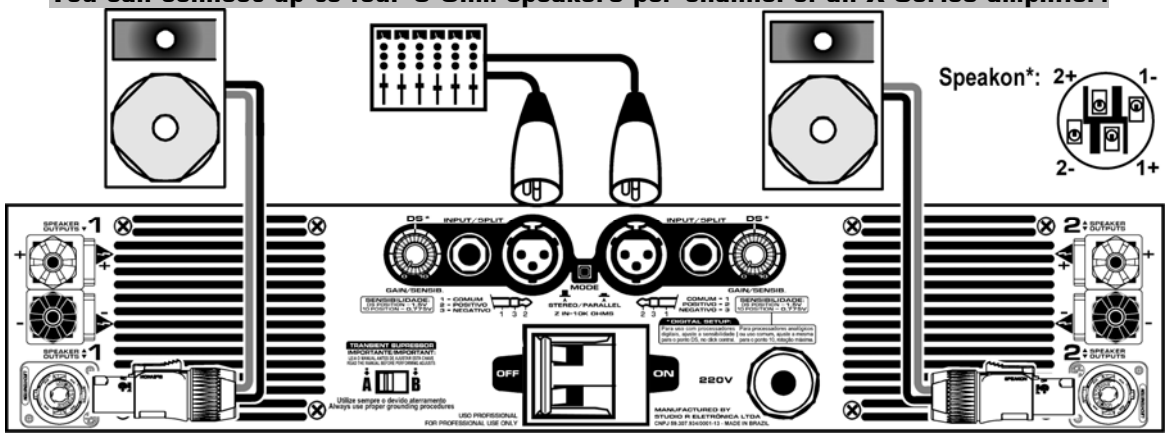
Pin 1 - Ground.
Pin 2 – Positive (phase).
Pin 3 – Negative (counter-phase).



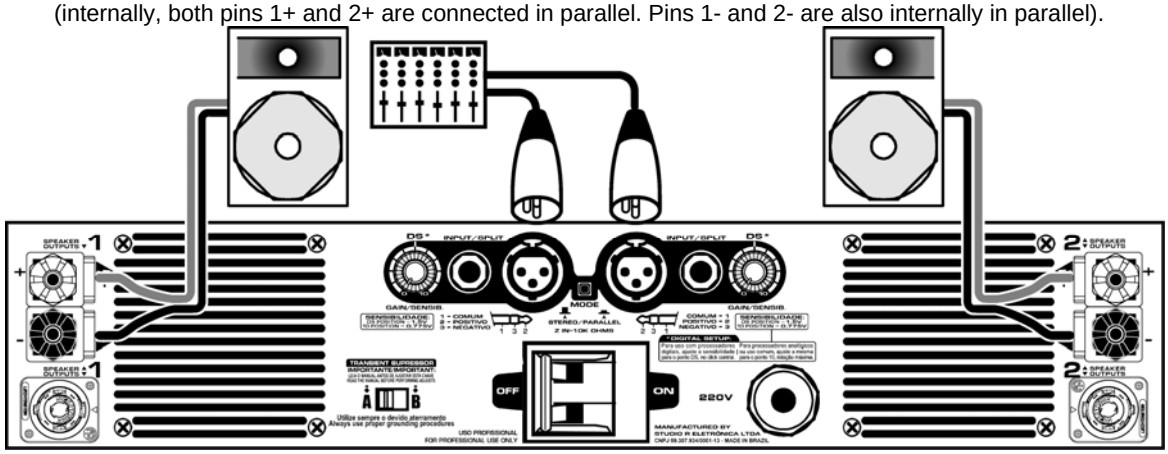
The **X SERIES** amplifiers contain balanced inputs and can be powered either by balanced lines or not, according to the figures.

Figures bellow shows the basic diagram for the rear connections using binding posts or Speakon. You can connect the mixer L channel to the amp input 1, and the R channel to the amplifier input 2, for example. The same precaution should be taken for connecting the speakers. The speakers located on the right side of the stage should be connected to the right channel (OUTPUT 2), and those of the other side on the left channel (OUTPUT 1). **The speaker polarity is very important.** The speaker positive should be connected to the amplifier + positive and the speaker negative to the amplifier - negative connection.

VERY IMPORTANT:
You can connect up to four 8 Ohm speakers per channel of an X Series amplifier!



***** Always connect the speaker positive (+) to speakon's pin 1+ or 2+ and the negative to pin 1- or 2- (internally, both pins 1+ and 2+ are connected in parallel. Pins 1- and 2- are also internally in parallel).



2.5 Connecting the outputs:

The speakers should be connected to the amplifiers by wires which, in the first place, are capable of the minimum current necessary for the work.

Wire minimum gauge in mm^2					
	X1	**X3 e XD**	**X5**	**X8**	**X12**
One wire for each speaker	$1mm^2$	$1,5mm^2$	$2,5mm^2$	3 or $4mm^2$	$4mm^2$
One wire for each two speakers	$1,5mm^2$	$2,5mm^2$	$5mm^2$		
One wire for the four speakers	$3mm^2$	$5mm^2$			

As we can see on the table below, in some instances, using only one wire to convey the signal to the 4 speakers is complicated, as a quite thick wire is required. The suggestion is to use one wire for each two speakers.

In addition to the current capacity of the speaker connecting wires, it is also important to know the distance between the speakers and the amplifier. Even with the proper gauge wire, we may have losses of power and damping factor on long-distance connections.

On the table below, see the power loss in percentage and, in parentheses, the resulting Damping Factor.

ⓘ The drop in the Damping Factor occurs on any amplifier by simply existing a wire between same and the speaker.

We can see in bold letters that the losses, in long distances, exceed 10% and that the damping factor also drops below 10. For example, a 12% loss on a 3000-W amplifier causes a 360 W on the wires, and the speakers receives only 2640 W.

Length of the wire pair (m)	Gauge (mm^2)	Power loss on the wires for each speaker	Power loss on the wires for every 2 speakers
5	1	2.2% (45)	
5	1.5	1.5% (67)	3% (34)
5	2.0	1% (90)	2.2% (45)
5	2.5	0.85% (114)	1.75% (57)
5	3	0.7% (140)	1.4% (66)
10	1	4.4% (23)	
10	1.5	3% (34)	6% (16)
10	2.0	2% (46)	4.4% (25)
10	2.5	1.7% (57)	3.5% (28)
10	3	1.4% (66)	2.8% (33)
20	1	8.8% (11)	
20	1.5	6.0% (16)	**12% (8.3)**
20	2.0	4% (22)	8.8% (11)
20	2.5	3.4% (28)	7% (10)
20	3	2.8% (33)	6% (16)

IMPORTANT: EXCLUSIVE 4X4 SYSTEM

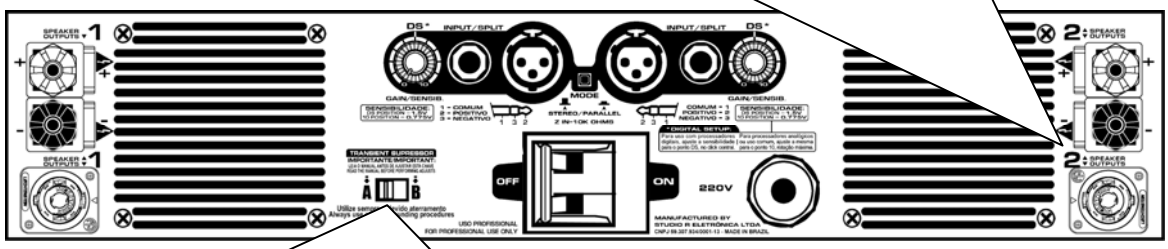
The Studio R amplifiers allows 4 speakers to be used on each channel, causing the amplifier to supply its maximum power on such conditions.

Actually, with 4 speakers per channel we have around 1.5 Ohm of actual load, not the theoretical 2 Ohm. Other amps in the market are designed for a minimum actual load of 2 Ohm and, thereby, do not operate properly with above 3 speakers per channel. They play, but heat too much, activating the protection circuits and dropping the power to values well below the specified minimum power.

When we use amplifiers designed for 2 Ohm, we are compelled to using maximum 3 speakers per channel, if we want to use their power to the fullest extent.

THIS DOES NOT OCCUR WITH THE STUDIO R. THAT'S ONE OF THE REASONS WHY A STUDIO R ALWAYS PLAY LOUDER!

SPEAKER OUTPUTS: This is where the speakers should be connected to (using Speakon or binding posts). Connect the amplifier positive lug to the speaker positive and the amplifier negative lug to the speaker negative. Output **1** should be connected to the system left side speakers, while output **2** should be connected to the system right side on stereo systems.



Floating ground and Transient Supressor: Your amplifier circuit ground is insulated from the frame. This allows various safety configurations to be made for the system grounding. For more information, refer to the chapter 6.1 about the Transient Supressor bar and problems related to lightning systems.

2.5.1 BINDING POSTS FOR THE SPEAKER WIRES.

We should use wires with "banana" or "fork" connectors, the second (fork) being more reliable in the long run (the banana connector gets loose in a short time). The speaker positive should be connected, and the binding post with **red lug** regarded as **"hot"**, which should never be connected directly to the ground. The other side of the speaker should be connected to the black lug.
As we see, there is a pair of lugs on each amplifier output channel.

Never connect any wire directly between the left channel lugs and those of the right channel and vice-versa.

2.6 Turning your X Series power on:

Your Studio R power cable has 3 wires and no connector. The user should check the consumption table and, according to the intended use of his/her equipment, purchase the male and female connector of your preference, with the appropriate capacity for the length, power consumption and use. The power cable is available in two different standards:

International: Brown=Hot, Blue=Neutral and Green=Ground.
American: Black=Fase, White=Neutral and Green=Ground.

The **X Series** amplifiers are designed to operate on one voltage only, selected in factory according to user's preference (available in 100, 115V, 127, 220, 230 or 240V - 50 / 60Hz) and indicated on the label attached to the cable or rear panel.

Under full power, with both channels set to 1.5 Ohm (4 speakers per channel), your **Studio R X Series** amplifier may "pull" a considerable current. See on the table below what is the minimum recommendable gauge to use on your AC power installation according to the number of speakers to use and the type of music.

NOTE: THE TABLE VALUES WERE CALCULATED FOR 230 V, WITH A SETTING BETTER THAN 5% (WHICH IS A SATISFACTORY SETTING), ON AN INSTALLATION WITH NO MORE THAN 50 METERS BETWEEN THE POWER FRAME AND THE AMPLIFIER.
When longer distance connections are required, such as for example 100 meters (double the distance), we should use double the gauge as well.
In case of a sound system leasing company, where music is generally reproduced, we should always size the AC system for the PINK NOISE rate:

Wire gauges for 230V – 50/60Hz (multiply for 2 in 100 to 127V versions):

PINK NOISE	X1	X3 e XD	X5	X8	X12
4 speakers per channel	1,5mm²	3mm²	5mm²	8mm²	2 x 5mm²
2 speakers per channel	1mm²	2,5mm²	4mm²	6mm²	8mm²
1 speaker per channel	1mm²	1,5mm²	3mm²	5mm²	6mm²

ROCK WITH COMPRESSION	X1	X3 e XD	X5	X8	X12
4 speakers per channel	1mm²	2,5mm²	5mm²	8mm²	2 x 5mm²
2 speakers per channel	1mm²	2mm²	4mm²	6mm²	8mm²
1 speaker per channel	1mm²	1,5mm²	3mm²	5mm²	6mm²

AMBIENT MUSIC	X1	X3 e XD	X5	X8	X12
4 speakers per channel	1mm²	2mm²	4mm²	6mm²	8mm²
2 speakers per channel	1mm²	1,5mm²	3mm²	5mm²	6mm²
1 speaker per channel	0,75mm²	1,5mm²	2,5mm²	4mm²	5mm²

All **STUDIO R X Series** amplifiers come with power cable. The user should check the consumption table and, according to the intended use of his/her equipment, purchase the male and female connector with the appropriate capacity for the length.

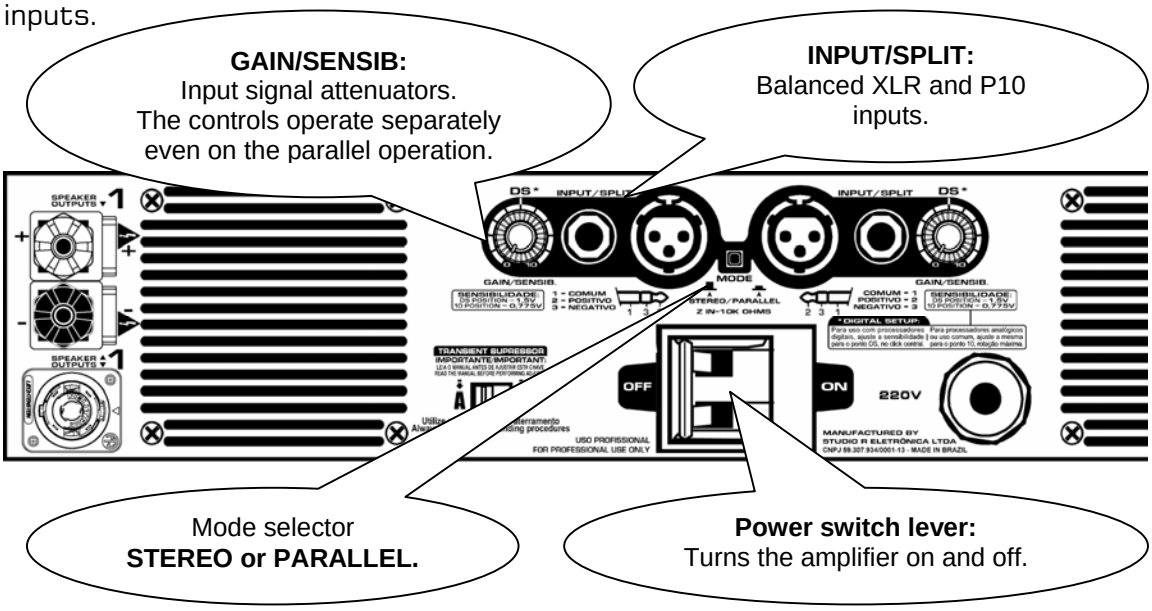
2.7 Stereo Operation:

For stereo operation, place an audio signal on channel 1 input, with an amplitude consistent with the amplifier sensitivity, (selectable according to the SDS table), in order to produce a signal output on channel 1 output lugs, while a signal on the 2 will produce a signal output on 2.

SDS table (gain/sensitivity adjust):		
Sensitivity	**Euro Version**	**Regular Version**
DS (centered gain - "DS" point)	26dB / 20x	1.55V (**X1**=2V, **X12**=1,8V)
Maximum (gain at 10 position)	32dB / 40x	0.775V (**X1**=1V, **X12**=0,9V)

IMPORTANT: The 1.55V level (in regular versions) is equal to -6dBm or -6 dBU. You must always use this level, instead of 0.775V, when using digital processors (2V for the X1). In other cases, adjust according to your system sensitivity.

Both channels operate on a completely independent way, with their respective input attenuators controlling the total levels. In order to distribute the signals to other amplifiers we must use the XLR male outputs which are just below the inputs.



2.8 Parallel operation:

Both channels, on the parallel mode, can be fed by a single input signal source without the need for any bridge. The signal applied on the channel 1 "XLR" will activate both sides with the signal on phase. The output connections are made on the same way as the stereo mode via the channel and black lugs. Both input attenuators remain active, allowing for different levels for the speakers of each channel. The power specifications continue the same as in the stereo operating mode.

Attention: With the input switch on the parallel mode we cannot feed the amplifier inputs with distinct signals, as they will be short-circuited.

2.9 Input signal attenuators (GAIN/SENSIB).

The rotary controls located on the back panel of your **Studio R**, one for each channel, allow the input sensitivity to be individually set with a reasonable resolution. On the scale recorded on the panel from 0 to 10, the amplifier input signal level on the stereo and parallel modes can be individually modified. When fully turned on the clockwise direction, they will allow a signal on the input sensitivity rate **32dB/40x (All Euro Version)** or **0,775V (X3 to X8), 1V (X1)** and **0,9V (X12)** to provide a maximum power on a 2 or 1.5-ohm load. When at the center click point (DS), sensitivity rate will be **26dB/20x (All Euro Version)** or **1,55V (X3 to X8), 2V (X1)** and **1,8V (X12).**

IMPORTANT: As the attenuators are independent, the channels can be set with different signal levels. This occurs when each one of the channels are being used for different environments or on different frequency ranges such as bass and treble. (The speakers always withstand more power than the drivers. Be careful with the settings!).

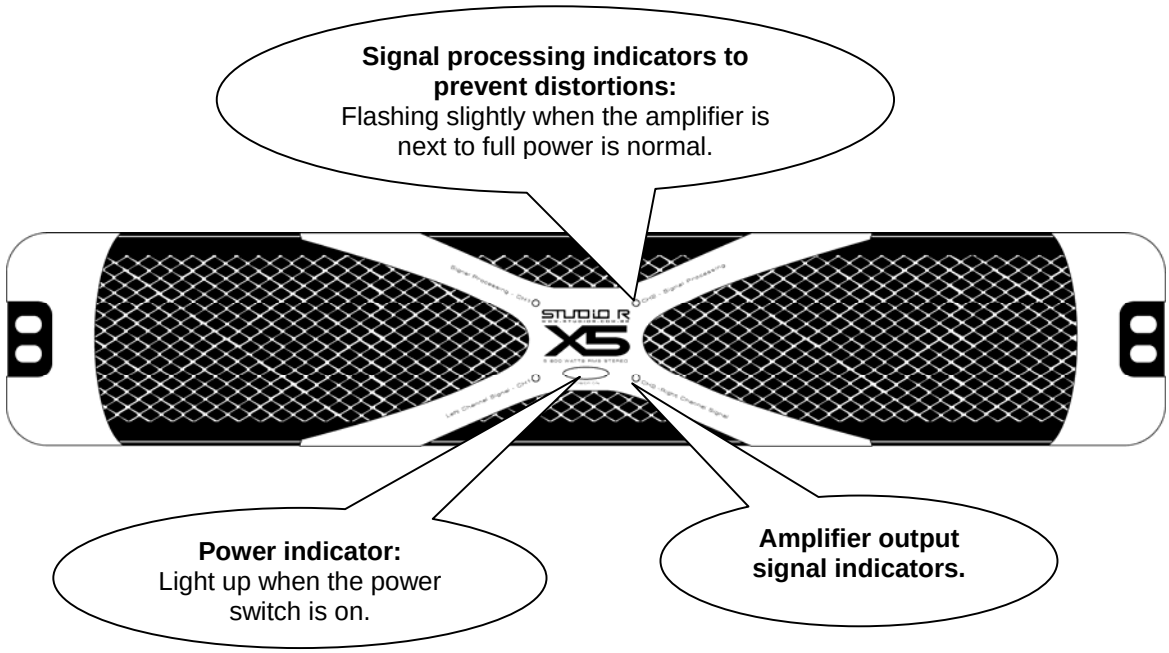
ⓘ VERY IMPORTANT ⓘ
THE INPUT SENSITIVITY CONTROLS OF THE X SERIES AMPLIFIERS ARE NOT POWER SETTINGS (A HEAVY-DUTY LINE EXCLUSIVENESS!). **The regular setting of these will never be able to protect delicate speakers. In these instances, an appropriate external limiter should be used.**

3 - CONTROLS

3.1 Power Switch:

The ON/OFF switch of the **Studio R X Series** amplifiers are located on the rear panel. In normal use, when the switch is turned to right, the amplifier is on and one blue LEDs will light on the front panel.

ⓘ ATTENTION
Prior to turning your amplifier on, make sure the power line voltage is the same as the apparatus.
This is statistically the only way of damaging a **Studio R**. In addition, it is regarded as a misuse and is not covered by the warranty.



4 – INDICATORS:

The **Studio R X Series** amplifiers are equipped with LED-type light indicators, individual for each channel, which report the user on the operational condition. If the power is on, the big blue LED **"POWER"** light up.

If a signal is present on the output, two green LEDs **"SIGNAL"** will flash according to the signal on each one of the channels. When the maximum output power is near to be reached, blue LEDs **"PROCESSING"** will light up according to the intensity of the limiter acting and activation, as following detailed:

4.1 Processing indicators:

When the **processing blue LED** lights up, this indicates that the input signal limitation has started. When the red LED flashes occasionally, a tolerable soft limiting will be occurring. In case the input signal exceeds too much the input nominal level, the limiter will start operating so as to avoid any distortions greater than 2%.

5 - PROTECTION FEATURES

The **Studio R X Series** amplifiers incorporate several protection systems, both for the amplifier and the speakers.

We seek to produce your amplifier on a "fail-safe" way, impenetrable by short-circuits, open circuits, overloads, unequal loads, and damages due to overheating. Under conditions where protection mechanisms are enabled, the operation stops until the problem is cleared. See the following:

5.1 Impedance sensor:

All **Studio R** amplifiers are provided with a system to assess the load type on their output. In view of an excess load, this limits the maximum output current without causing any severe distortions.

5.2 Thermal Protection:

Studio R amplifier dissipator is the most effective available in the market. It provides double the required thermal capacity and its internal fan will keep the amplifier operating within the desired temperature limits under normal conditions. Should the temperature (or heat dissipator) reach 95º C due to an improper air supply, air input or output blocking, or else due to the breakdown of its own fan, a thermal sensor will be enabled in such a way to protect each channel individually until the temperature returns to an acceptable level.

5.3 Short-circuit:

Should a short-circuit be applied to an output, the limiter and thermal circuits will protect the amplifier.

5.4 Fuses:

The **X Series** amplifiers are fitted with a magnetic actuation circuit breaker which eliminates the need for using line fuses. Assuming an accident occurs where the amplifier output electronics are severely damaged, your amplifier still relies on internal fuses which prevent the fault from propagating to other system portions. **The stoppage of one of the channels never interferes in the operation of the other channel.**

Soft Start.

When you turn on a **Studio R X Series** amplifier, its circuits are powered on a symmetrical and completely silent way. **Always wait at least 10 seconds before each amplifier's switching on and switching off to avoid overloads.**

Dual Opto-limiter.

With the **X Series** limiter, you will always be able to use your PA under full power, avoiding any distortion. Even when the line power is quite altered, your **Studio R** will know how to dispense the power in order to eliminate any audible distortion.

6 – SPEAKER PROTECTION METHODS:

The X Series amplifiers contains a adjustable 18dB/octave High-Pass filter, default selected in 30Hz.

All speakers present physical limits. The most critical ones are the thermal and mechanical limits, which should be observed so as to avoid its operation stoppage.

Studio R amplifiers contain energy enough to damage most of the speakers existing in the market without much effort, if misused.

Make sure that the frequency range used is appropriate for the speaker, particularly the subsonic frequencies which are not reproduced by the speaker. Always set your crossover to the ideal frequencies. Check the speaker manual for determining the maximum "X" and "f3".

☞ **TIP: Ask for the service leaflet to the speaker manufacturer in order for your own technician to master the subject.**

⃠ **Never power DRIVERS and TWEETERS without an appropriate series capacitor!**

For drivers, an optimum value is 47 micro Faraday.
For most of the tweeters, a 5.6uF capacitor is appropriate.

6.1 – THE TRANSIENT SUPRESSOR AUXILIAR SYSTEM:

The **Transient Supressor switch** (see amplifier's rear panel), activates, when turned connected, additional protection for transients usually generated by lighting systems, for example. When switched to "**B**" and additional protection against transients that are usually generated by lighting equipment is activated. When switched to "**A**" it connects the system common to the chassis.

Attention: The transient supressor works only with the amplifier grounded properly, otherwise, it must be not used, but **ungrounded use is NEVER RECOMENDED** in order to prevent the risk of shock or fire hazard. Always check to see that the amplifiers are properly grounded.

7 – MAINTENANCE:

Your **Studio R** amplifier does not require much maintenance, which is restricted to its outer cleaning and cooling system eventual hindrance removal. Do not use any solvent, but only a cloth wet with water and soap. The amplifier should not require any internal adjustment during its lifetime.

ⓘ **NEVER BLOW COMPRESSED AIR INTO THE AMPLIFIER ELECTRONICS OR ANY OTHER SIMILAR EQUIPMENT.**

8 – USER RESPONSIBILITY:

YOUR AMPLIFIER IS QUITE POWERFUL
AND CAN BE POTENTIALLY DANGEROUS!

STUDIO R IS NOT RESPONSIBLE FOR ANY DAMAGE CAUSED TO HUMANS OR SPEAKERS. FOLLOW CAREFULLY THE INSTRUCTIONS SET FORTH IN THE MANUAL AND THE RELEVANT STANDARDS RELATED TO YOUR INDUSTRY.

9 – WARRANTY::

Studio R provides the purchaser of any **X Series** amplifier with a warranty against defects on the components and assembly for a **3-year***** time as of the purchasing date (***Valid for Brazil. Please check with your dealer about local warraty).

IMPORTANT:

Studio R reserves the right to introduce changes or improvements into the design and manufacturing of its amplifiers, without undertaking any obligation to do so in the previously manufactured products.

Do not forget to send us the registration sheet already filled out to make it easier for serving you and sending information and future novelties. Such registration can also be made on our site: www.studior.com.br

In the event you are unable to install or to take the best profit you expect from your equipment, get in touch with our **International Technical Support:**

studior@studior.com.br

STUDIO R Eletronica LTDA
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E-mail: **studior@studior.com.br**

General Specifications:	230V 60 Hz or 127V 60 Hz power line			
CLASSIFICATION	**X1:** Class AB High-polarization	**XD:** Class AB High-polarization	**X3**-**X5:** Class AB variable	**X8-X12:** Class H MOSFET
HARMONIC DISTORTION 1KHz @ 1/2 of rated power	**X1:** 0,015%, 2 Ohm 0,008%, 4 Ohm 0,005%, 8 Ohm	**XD:** 0,02%, 2 Ohm 0,015%, 4 Ohm 0,008%, 8 Ohm	**X3**-**X5:** 0,09%, 2 Ohm 0,05%, 4 Ohm 0,02%, 8 Ohm	**X8-X12:** 0,1%, 2 Ohm 0,07%, 4 Ohm 0,04%, 8 Ohm
HARMONIC DISTORTION 20Hz-20KHz @ rated power	**X1:** less than 0,025%	**XD:** less than 0,025%	**X3**-**X5:** less than 0,9%	**X8-X12:** less than 1%
FREQUENCY RESPONSE	**X1:** 20Hz to 20khz +/- 0,5dB. Programable	**XD:** 20Hz to 20khz +/- 0,5dB. Programable	**X3**-**X5:** 20Hz to 20khz +/- 0,5dB. Programable	**X8-X12:** 20Hz to 20khz +/- 0,5dB. Programable
DAMPING FACTOR	**X1:** >2000 @ 8 Ohm from 40 to 165Hz. **>1000 to 10kHz**	**XD:** >2000 @ 8 Ohm from 40 to 165Hz. **>800 to 10kHz**	**X3**-**X5:** >2000 @ 8 Ohm from 40 to 165Hz.	**X8-X12:** >2000 @ 8 Ohm from 40 to 165Hz.
NOISE	**X1:** 105 dBA related to the max. rated power output.	**XD:** 105 dBA related to the max. rated power output	**X8:** 100 dBA related to the max. rated power output.	**X1:** 100 dBA related to the max. rated power output.
SENSITIVITY	32dB / 40x or 26dB / 20x selectable. See SDS table, page 8.			
INPUT IMPEDANCE	10 KOhm balanced			
CONTROLS	Rear: Power switch, stereo/parallel switch, rotary settings for the input signal attenuation.			
INDICATORS	Power - 1 blue LEDs Signal - 2 green LEDs Processing - 2 blue LEDs			
CONNECTORS	Line inputs and outputs: 2 XLR female connectors and 2 P10 female connectors, balanced (pin 1 and 3 ground, 2" +"). Transient supressor, floating ground and chassis connecting bar. Speakers: 2 pairs of 1/4' lugs (one pair for each channel) and Speakon.			
COOLING	Dual aluminum duct with forced ventilation.			
PROTECTION	Dual opto-limiter, Soft Start, short-circuited or open output, reactive or mismatched loads, and over the input signal. Independent thermal sensors for each channel.			
LOAD PROTECTION	silent ON/OFF, DC on the output			
OUTPUT CIRCUIT	Linear complementary, Soft Clip.			
POWER	Available in 100, 115, 127, 220, 230 or 240V - 50/60Hz versions.			
PRECISE CONSUMPTION	**X1-XD:** 1.55 times the output power used.	**X3**-**X5:** 1.35 times the output power used.	**X8-X12:** 1.3 times the output power used.	
DIMENSONS (height x width x depth)	**X1 to X8**: 88.9mm x 483mm x 325mm (+ 45mm for rear support ears). **X12:** 88,9mm x 483mm x 440mm (+ 45mm for rear support ears).			
WEIGHT/RATED POWER and MAXIMUM CONSUMPTION	**X1** = 15.5kg/ 1200 W. 220V-10A (20A for 115 to 127V versions) **XD** = 15,5kg/ 3600 W. 220V-21A (42A for 115 to 127V versions) **X3** = 16kg/ 3600 W. 220V-21A (42A for 115 to 127V versions) **X5** = 16kg/ 5600 W. 220V-32A (64A for 115 to 127V versions) **X8** = 16kg/ 8000 W. 220V-50A (100A for 115 to 127V versions) **X12** = 17kg/ 11.000 W, 220V-68A (136A for 115 to 127V versions)			

SINUSOIDAL POWER TABLE (Watts RMS): Valid for 230V/60Hz line, harmonic distortion 1% to 1 KHz. For line voltage variations of 10%, the powers may vary up to + or – 22% (IEC268 Standard).

Model/Condition	X1	X3 e XD	X5	X8	X12
2 Ohm-2 channels	1.200W	3.600W	5.600W	8.000W	11.000W
4 Ohm-2 channels	1.000W	2.240W	3.500W	4.700W	6.400W
8 Ohm-2 channels	600W	1.280W	2.000W	2.600W	3.500W
2 Ohm-1 channel	700W	2.150W	3.340W	4.200W	5.700W
4 Ohm-1 channel	420W	1.250W	1.950W	2.500W	3.500W
8 Ohm-1 channel	360W	700W	1.100W	1.380W	1.900W
1.5 Ohm-2 channels	**1.200W**	**3.600W**	**5.600W**	**8.600W**	**13.000W**