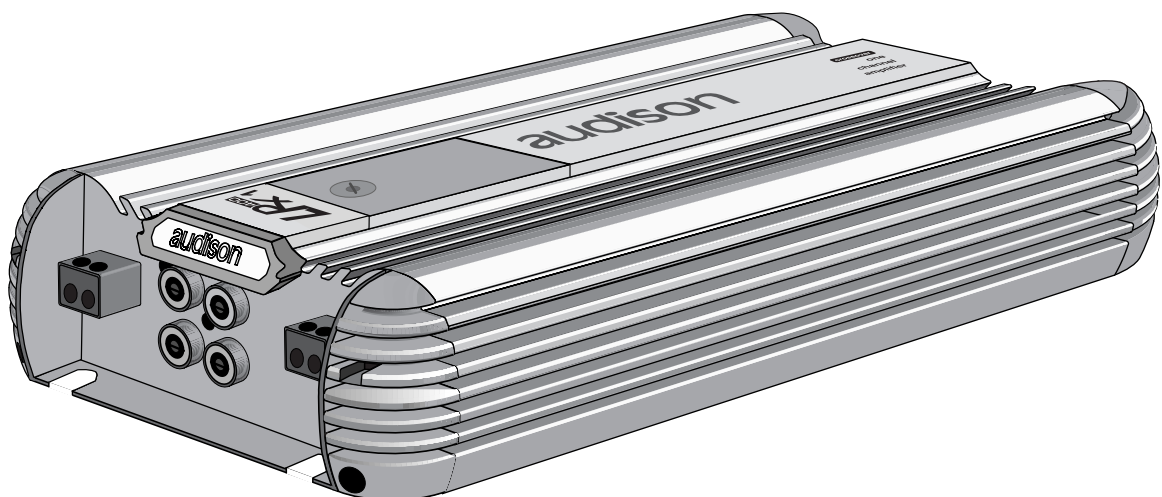


audison

OWNER'S MANUAL

CAR POWER AMPLIFIER

LR⁴⁰⁰_{X1}



INTRODUCTION

INTRODUCTION

Audison thanks you for preferring this product and compliments you on your choice since it was designed in order to insure outstanding musical and instrumental performances.

Before use instructions, please carefully read the safety norms you have to respect in order to avoid unpleasant inconveniences and to enjoy this product at best.

PRECAUTIONS

- Avoid to install the amplifier where temperature is below 0°C or above 55°C and in non ventilated places.
- The amplifier needs 12VDC power supply voltage with negative to ground. Be sure that your car electric system is compatible with the amplifier ordinary functioning.
- For safer driving, we recommend to adjust volume not to drown external traffic sounds.

WARNING!:

While installing the amplifier, make sure that the cable coming from the battery positive pole (+) doesn't touch the amplifier heat sink.

The heat sink is directly connected to the battery negative pole (-) through the screws which fix it to the vehicle chassis. Its contact with the positive pole cable would cause short circuit and, thus, possible fires and battery damages.

Please connect power supply cables to the amplifier terminal blocks (POWER + and -) before and to battery AFTER, to get maximum safety.

CAUTIONS

INPUTS: If the source output signal ground (PRE OUT) is not connected to the source chassis and the system sound is not powerful enough or is distorted, try to solve the problem by connecting the output signal cable braided shield (PRE OUT) to a point of the source chassis.

OUTPUTS: Don't connect -L and -R power outputs to each other or to ground (car chassis). In case you use an external crossover, make sure that channels grounds are not connected one to the other.

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DESCRIPTION

Audison LRx 1.400:

Mono car power amplifier characterised by excellent musical performances, small size and outstanding energy reserve.

Its PWM power supply stage is stabilised and oversized. Thanks to its great capacity to supply current and to the use of three 70A Mosfets pairs, this amplifier can easily drive even the hardest loads.

Input stage is provided with a special circuit (LNS) which permits the system disturbances rejection, reducing noise that is usually due to the vehicle electric parts (alternator, electronic injection, etc.), without altering musical signal quality.

Amplifier stage is made with six pairs of 18A MOSFETs and A Class bipolar driver. This allows LRx 1.400 to satisfy any power needs, supplying 350W with 4 Ohm load, 650W at 2 Ohms and 900W at 1 Ohm in continuous mode. Differently from what occurs with other amplifiers, LRx 1.400 is not blocked by protection systems immediately below these load values. Its exclusive "Overload Limiter" circuit allows it to go on working, limiting output power and pointing out how hard the applied load is by the "Limit" LED blinking.

Its big power reserve, its constant control at low frequencies and its exquisite timbre qualities make it an ideal amplifier to drive subwoofer and Full Range systems and to realise configurations designed to attain very high sound pressures (SPL).

LRx 1.400 has a bypass subsonic filter (24dB/Oct.) with adjustable frequency, pre-set at 20Hz. It also has two bypass Butterworth crossovers with independent frequencies. LO-PASS filter has 24dB/Oct. slope; it's possible to adjust its Q factor. HI-PASS filter has a 12dB/Oct. slope; it handles the high frequencies signal to send to the preamplified output (PRE OUT). There is a phase inverter (0°÷180°) which is useful to recover the acoustic delay between subwoofer and front sections.

In case LRx amplifiers are used in extremely difficult conditions (very low loads) or in installations where space is too narrow and their heat sink cooling is not enough, they can be employed together with CLK2 cooling system (optional). It is a system made of two units to apply onto the amplifier sides; each of them is provided with an electronically controlled fan that allows the amplifier thermal stabilisation (see "CLK2 – LRx Cooling Kit").

Protection includes:

- **RGP** (Resettable Ground Protection) circuit; in case a short circuit occurs between loudspeakers outputs and car chassis, it detects a high current flow in the pre-input ground and acts by putting the amplifier in stand-by, protecting its circuitry;
- a device against short circuits and against DC in the outputs, to protect loudspeakers;
- a device that detects the amplifier temperature excessive increase and stops its functioning until optimal conditions occur again.

Once the causes which implied protection circuits intervention have been checked and solved, the amplifier is reset by switching it off and on again.

The amplifier is also provided with another general protection which is insured by an internal strip fuse, very easy to reach.

Optional:

The following devices are available upon request:

1 - Three kits for subwoofer volume remote control:

- VCR01 and VCRAK (analogue and specific for subwoofer);
- VCRDK (digital; it can be used for master volume control or for level control of any ways in a multichannel system).

2 - CLK2 cooling system.

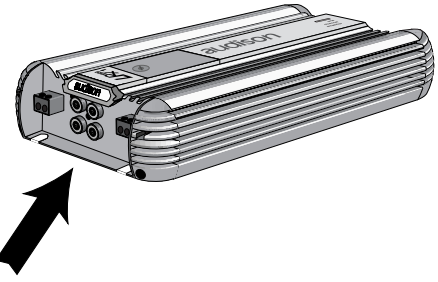
IN-OUT PANEL

FUNCTIONS

1

SPEAKER A/B (LO-BYPASS)

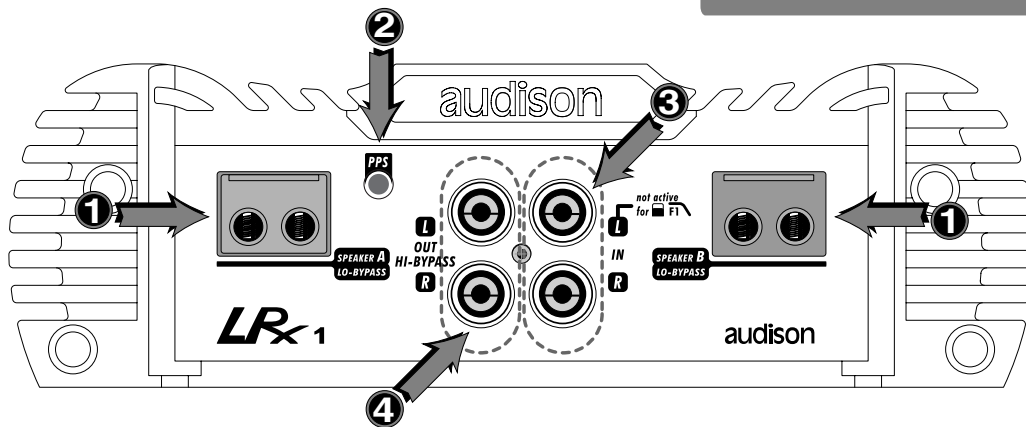
Amplifier power outputs. Signal is **MONO**. The two outputs are in parallel in order to allow the connection of one, two or more speakers. Connect the speakers cables to these outputs according to polarity. Terminal blocks accept cables up to 9 A.W.G. max (see "**audison cable** products for electric connections" as far as their size is concerned). We recommend the use of **audison cable** products.



2

PPS (Phantom Power Supply)

Power supply socket for **audison** external audio accessories.



3

IN

Amplifier left (**L**) and right (**R**) channels inputs. The preamplified outputs (PRE OUT) of a source (head unit, CD player, DAT, etc.) or of an external electronic crossover must be connected to them. If you bypass the LO-PASS filter (F1:) , only the right channel (**R**) signal will be amplified; if you apply preamplified signals to inputs, you'll always have them on the corresponding outputs (**OUT**).

4

OUT/HI-BYPASS

Amplifier left (**L**) and right (**R**) channels preamplified outputs. Available signal is Hi-PASS or full range (see "Configurations table").

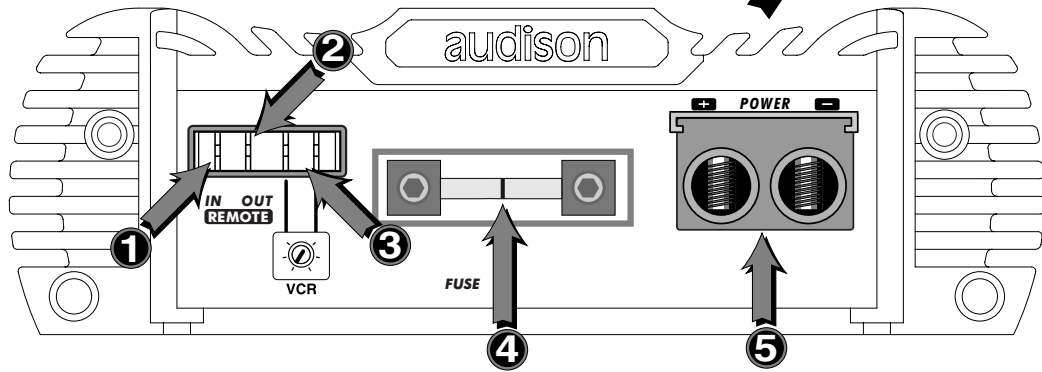
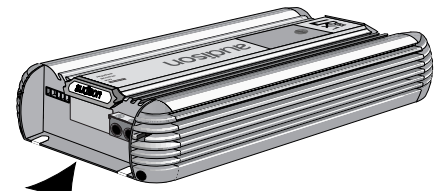
POWER SUPPLY PANEL

FUNCTIONS

1

REMOTE IN

Terminal to connect Remote cable, which comes from the source and which controls the amplifier switching on. Applied voltage must be between 7 and 15VDC.



2

REMOTE OUT

Terminal to repeat the switching on control (Remote IN) coming from the source. It is used to switch on another amplifier or device in the system simultaneously. Available voltage is the same as the one applied on Remote IN.

3

VCR (optional kit)

Terminals to connect VCR01/VCRA/VCRD adjuster included in VCR01K/VCRAK/VCRDK volume remote control kits.

4

FUSE (60A)

Strip fuse. It insures the amplifier general protection. In case the fuse breaks down, please replace it by respecting its original value.

CAUTION: If you want to protect the system even more, please put a strip fuse onto the cable which connects the battery positive pole to the amplifier POWER (+) terminal block (see "Electric connections").

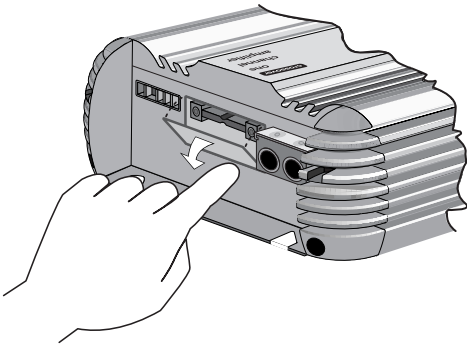
5

POWER

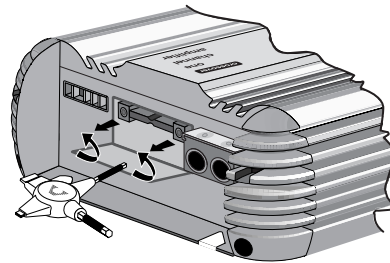
Terminal blocks for the amplifier power supply cable connection. Connect positive and negative poles according to indicated polarities. Holes have 8mm diameter and accept cables up to 3 A.W.G. max. In order to get the best current transfer, please use power supply cables with as big a section as possible. **audison cable** catalogue offers you a complete range of such products which can satisfy whatever demands; you can also find **Maincrimp** terminals in it. We strongly recommend their use because they contain the cable non protected end and allow the terminal block to fasten all its useful section.

POWER SUPPLY PANEL

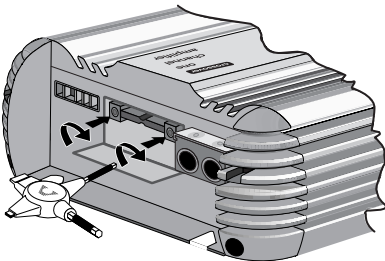
FUSE REPLACEMENT



1 - Open the transparent cover by pushing the two teeth in its lowest corners to the direction indicated by the arrows.

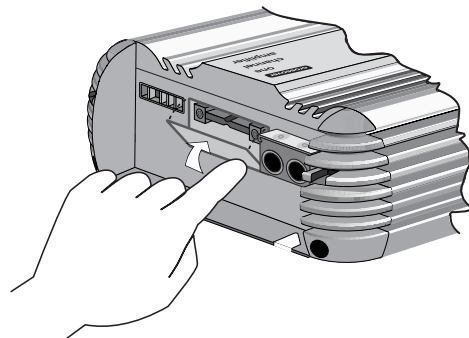


2 - Remove the screws which fasten the fuse to eliminate pieces of the broken one; prevent them from going into the device.



3 - Check the value of the new fuse to assemble, then fix it by gradually and alternately fastening the two screws. This will avoid voltage drops along the line and will make the device perfect functioning easier.

4 - Close the transparent cover.



CONTROLS PANEL

FUNCTIONS AND CONTROLS

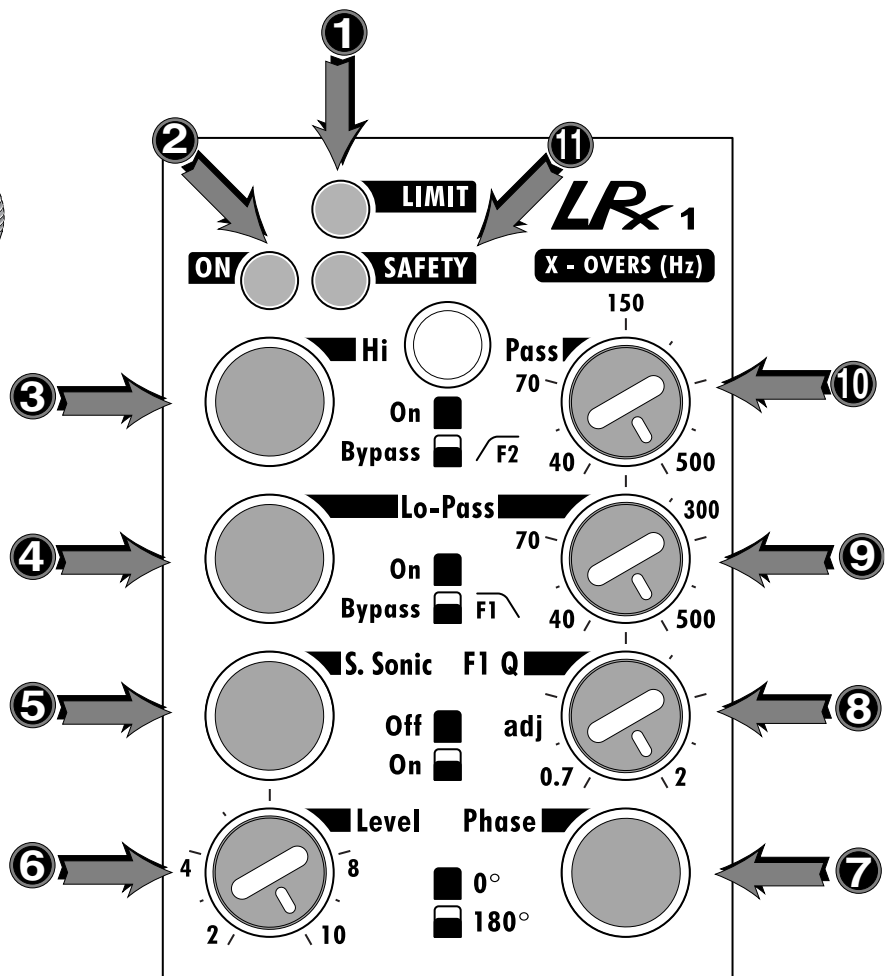
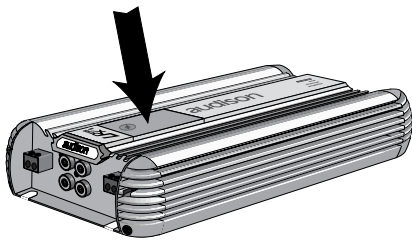
1

LIMIT (orange LED)

It indicates the Overload Limiter circuit is on.

Caution:

When this led is on (although sporadically), it means the applied load is a hard one. The activation of Overload Limiter circuit (output power limiter) will anyway allow the amplifier to function without distortions. In case Overload Limiter gets on too frequently (at every power peak), you will need to check if there are any failures or a too hard load (that's to say impedance is about 50% lower than the minimum recommended one). The amplifier can go on functioning in these conditions but power will inevitably decrease.



2

ON (green LED)

It indicates the amplifier is on.

3

HI-PASS

It permits to choose whether to send a full range signal (**BYPASS**) or a 12dB/Oct. HI-PASS signal for high frequencies (**ON**) to the preamplified output (**PRE OUT**).

CONTROLS PANEL

4

LO-PASS

It permits to choose whether to send a full range signal (**BYPASS**) or a 24dB/Oct. LO-PASS signal for low frequencies (**ON**) to the amplifier stage.

5

SUBSONIC

It permits to eliminate subsonic frequencies; these sounds cannot be heard by human ears but cause useless and damaging stress to amplifier and speakers. Subsonic filter can be bypassed (**BYPASS**) and it is pre-set at **20 Hz**. Its cut-off frequency can be adjusted between 16 and 32 Hz through 4 Hz steps; this occurs by replacing the special resistors located into a socket which can be reached through the setting panel in the amplifier bottom (see "Subsonic filter cut-off frequency modification").

6

LEVEL

It permits to adjust the amplifier input sensitivity and sets its output level.

7

PHASE (0 /180)

It permits to invert the phase of the signal on the speakers output terminal blocks. It is especially useful to acoustically align subwoofer and front system.

8

F1 Q

It permits to adjust the LO-PASS filter Q, varying the filter gain at its cut-off frequency. It is useful to linearise the system response in the HI-PASS and LO-PASS crossover point.

9

F1

It permits to adjust LO-PASS filter cut-off frequency between 40 Hz and 500 Hz.

10

F2

It permits to adjust HI-PASS filter cut-off frequency between 40 Hz and 500 Hz.

11

SAFETY (red LED)

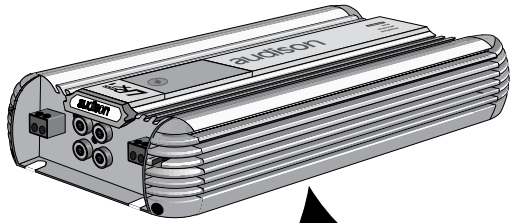
It indicates that the amplifier protection circuits are on. In order for the amplifier to work again, you need to switch the system off and then on after 10 seconds at least. We recommend to check all connections before switching the amplifier on again.

If LED stays on, please contact Audison authorised after sale centres.

SETTING PANEL

FUNCTIONS

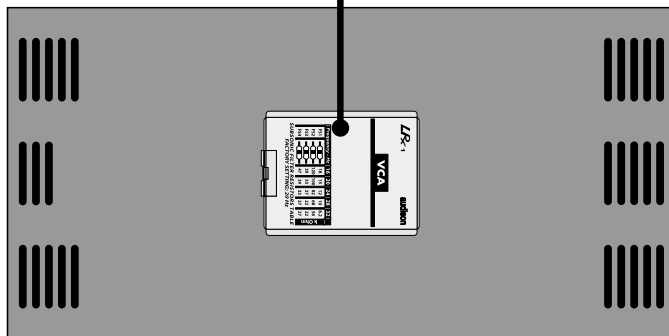
It permits to reach the resistors to set subsonic filter cut-off frequency and to insert VCA modules for the subwoofer volume remote control.



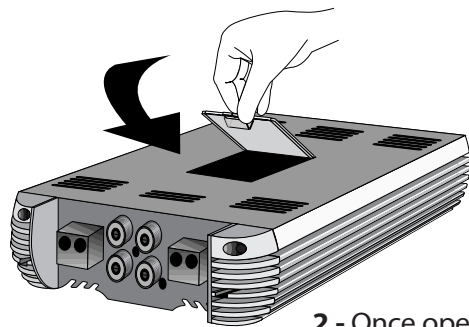
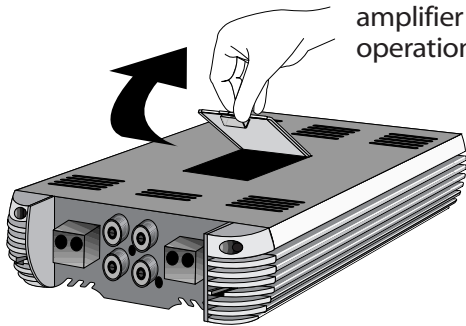
Setting panel

LR _{x1} VCA audison		16	20	24	28	32	kOhm
Frequency - Hz							
FS1		18	15	12	10	8.2	
FS2		120	100	82	68	56	
FS3		39	33	27	22	22	
FS4		47	39	33	27	27	

SUBSONIC FILTER RESISTORS TABLE
FACTORY SETTING: 20 Hz



1 - Remove the setting panel in the amplifier bottom in order to carry out operations.



2 - Once operations have been carried out, please close the setting panel.

SETTING PANEL

SUBSONIC FILTER CUT-OFF FREQUENCY MODIFICATION

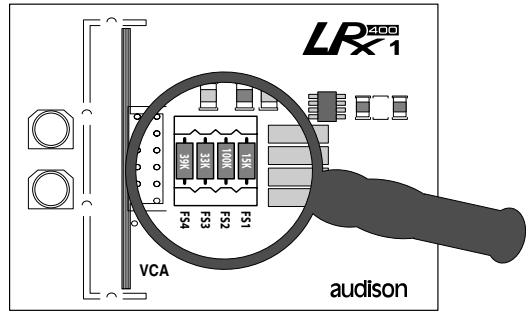
Subsonic filter is pre-adjusted at 20 Hz. In order to modify this value, please act according to what follows.

Procedure:

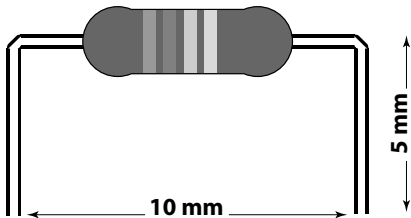


Frequency - Hz	16	20	24	28	32	
FS1		15	12	10	8.2	kOhm
FS2		100	82	68	56	
FS3		33	27	22	22	
FS4		39	33	27	27	

SUBSONIC FILTER RESISTORS TABLE
FACTORY SETTING: 20 Hz



Replace FS1, FS2, FS3, FS4 resistors according to the values in the setting panel table.



Remark: Cut the new resistors rheophores according to the size in the picture.

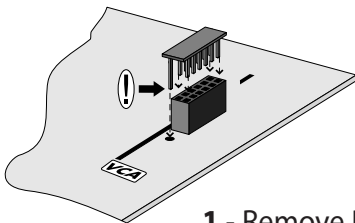
VCA-VCA1D MODULES INSERTION

LRx 1.400 can accept one of the three optional kits which allow the subwoofer volume remote control: VCR01K, VCRAK or VCRDK.

These kits have a specific module, VCA or VCA1D, to insert into the amplifier through the setting panel.

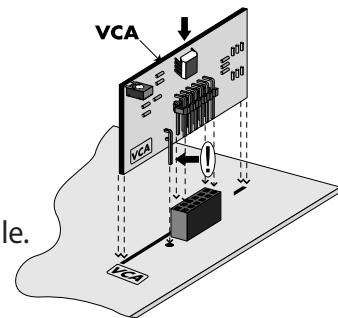
REMARK: please use VCRDK kit when the amplifier LO-PASS filter is off (F1:).

Installation:



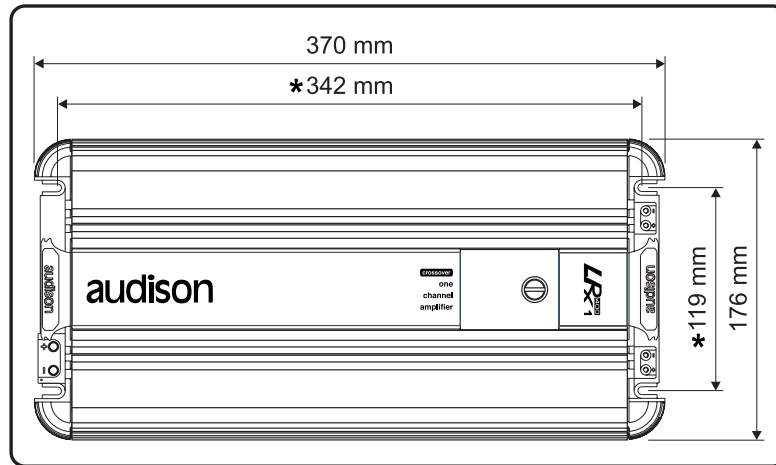
- Insertion key. It prevents the module from being inserted in the wrong way.

2 - Insert VCA/VCA1D module.



TECHNICAL FEATURES

SIZE FOR FIXING



* Drilling dimensions for fixing

LRx 1.400

<p>POWER SUPPLY Voltage: 11 ÷ 15 VDC Idling current: 1.9 A Idling current when off: 0.02 mA</p> <p>Consumption @ 13.8 VDC (Max Musical Power): - A config. (see Output Power): 20 A - B config. (see Output Power): 37.5 A - C config. (see Output Power): 55 A</p>	<p>Output power (RMS) @ 13.8 VDC; THD 1% - A config.: 350W x 1 (4 Ohm) - B config.: 650W x 1 (2 Ohm) - C config.: 900W x 1 (1 Ohm)</p>
<p>AMPLIFIER STAGE Distortion – THD (1kHz): 0.06 % Bandwidth (-3dB): 4 Hz ÷ 60 kHz S/N ratio(A weighed @ 1V): 105 dB Damping factor (1 kHz, 4 Ohms): 200 Input sensitivity: 0.2 ÷ 5 VRMS Input impedance: 15 kOhms</p> <p>Load impedance: - 1 Ch. mono: 4 - 2 - 1 Ohms</p> <p>Nominal output power (RMS) NP @ 12VDC; THD 0.3%: 300W x 1 (4 Ohms)</p>	<p>FILTERS/INPUTS Sub: Bypass/ 24dB/Oct. Lo-Pass (40 ÷ 500 Hz) Phase: 0° ÷ 180° Q control (LO-PASS): 0.7 ÷ 2 Subsonic: Bypass/ 24dB/Oct. Hi-Pass, 16÷32 Hz (pre-set at 20 Hz) Pre Out: . Bypass/ 12dB/Oct. Hi-Pass (40 ÷ 500 Hz) Inputs: IN L-R</p>
	<p>OTHER FUNCTIONS Remote IN: 7 ÷ 15 VDC – 1 mA Remote OUT: 12 VDC – 10 mA Auxiliary power supply (PPS): . ±12 VDC – 300 mA IN VCR (SUB volume) VCA/VCA1D attenuation: 100 dB Fuse: 60 A</p>
	<p>MAX SIZE (L x H x D): 176 x 56 x 370 mm WEIGHT: 3.6 kg</p>

ACCESSORIES

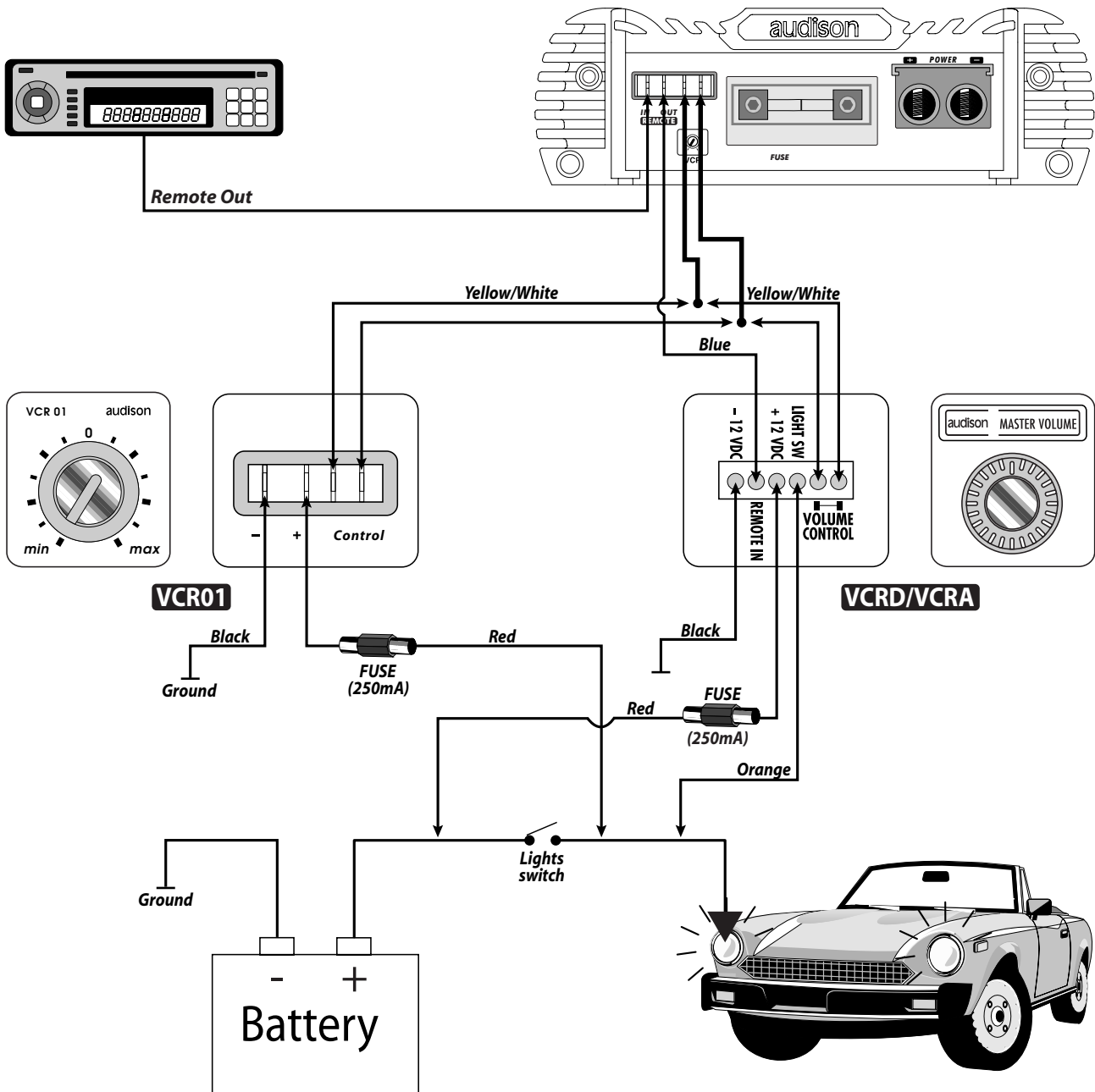
VCR01K, VCRAK and VCRDK

LRx 1.400 can accept one of the optional kits that allow the subwoofer volume remote control. VCR01K and VCRAK are analogue and special for sub; VCRDK is digital and can be used for master volume control or for level control of any ways in a multichannel system.

These kits are available as accessories and consist of three elements:

- 1) Volume adjuster (VCR01/VCRA/VCRD);
- 2) VCA/VCA1D module to put inside the amplifiers;
- 3) Wire to connect VCR01/VCRA/VCRD adjusters to the proper sockets in the amplifier rear panel and to the car lights switch, in order to light it up.

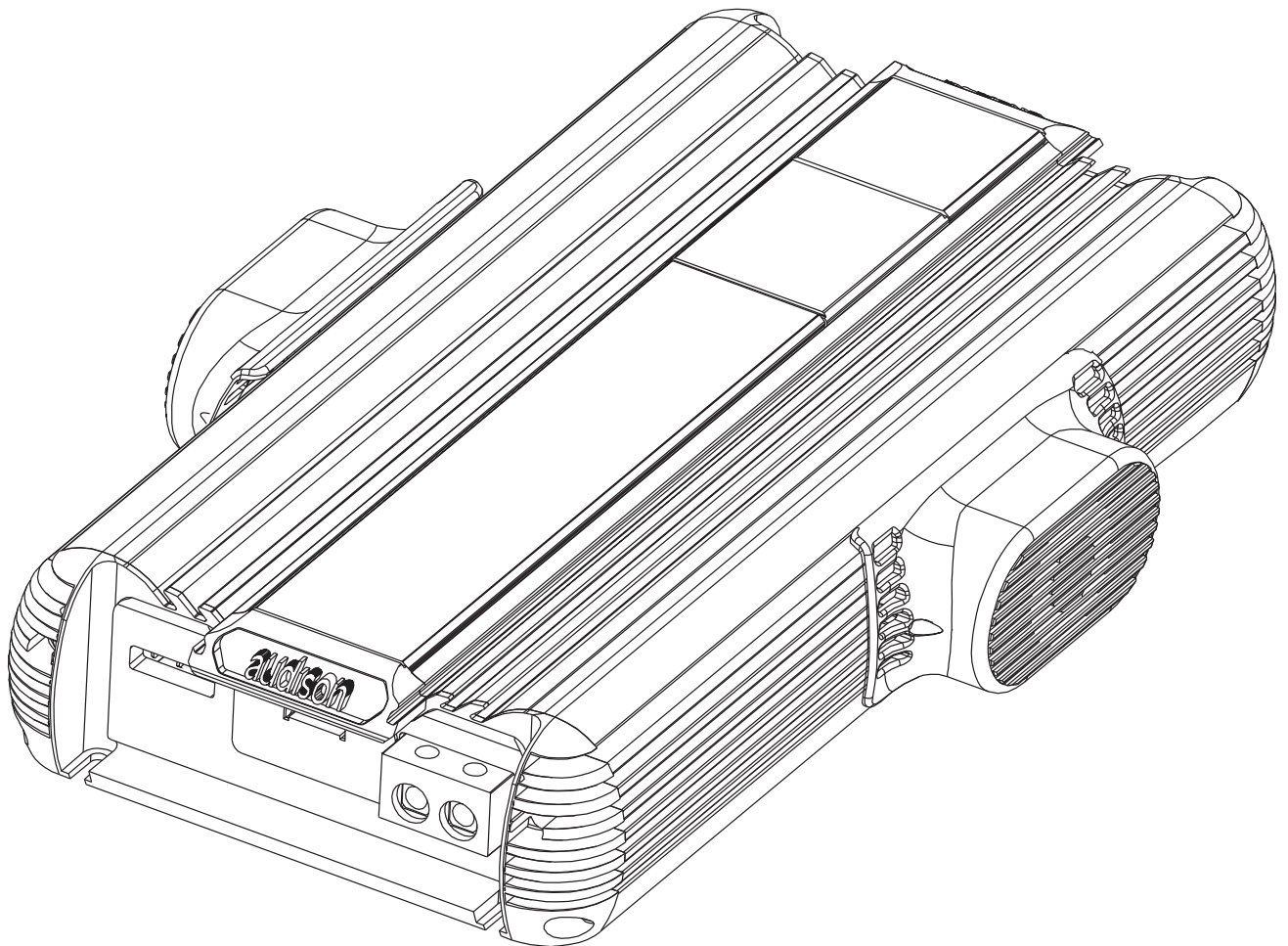
Install VCR01/VCRA/VCRD adjusters in a place you can easily and comfortably reach, according to the following connection diagram.



CLK2 - LRx Cooling Kit

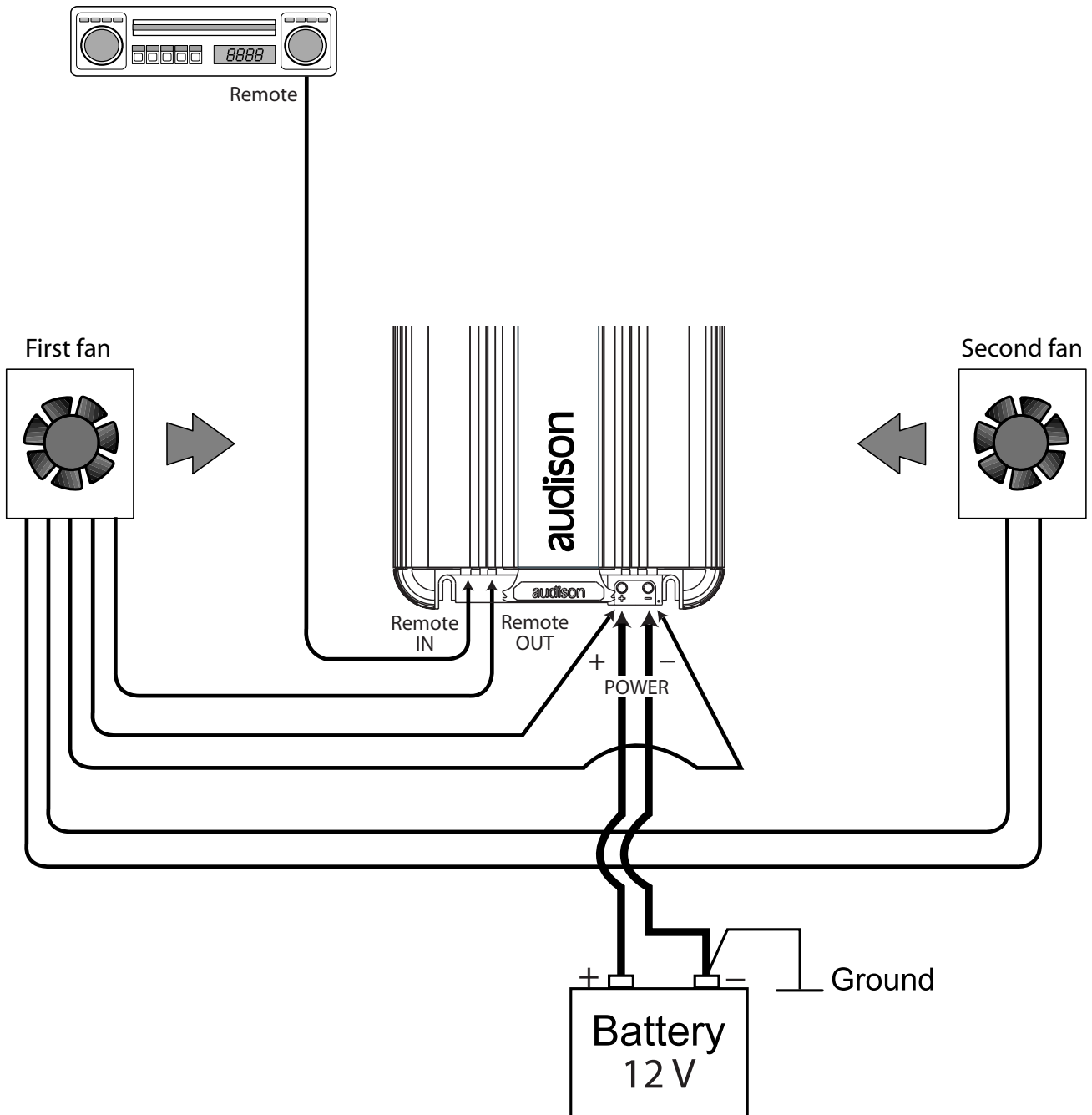
This cooling system is specially designed to provide LRx amplifiers with the right working temperature. **CLK2** should be used when LRx amplifiers work in extremely hard conditions (very low loads) or in installations where space is too narrow and heat sink cooling is not enough. It consists of two units to apply onto the amplifier sides; each of them is provided with an electronically controlled fan. Its intervention depends on a thermal sensor that starts the system as soon as LRx heat sink reaches 45°C. The same sensor is connected to a special circuit which controls the two fans speed progressive increase when temperature increases, too.

Air flux constant control allows the amplifier very good thermal stabilization and limits noise.



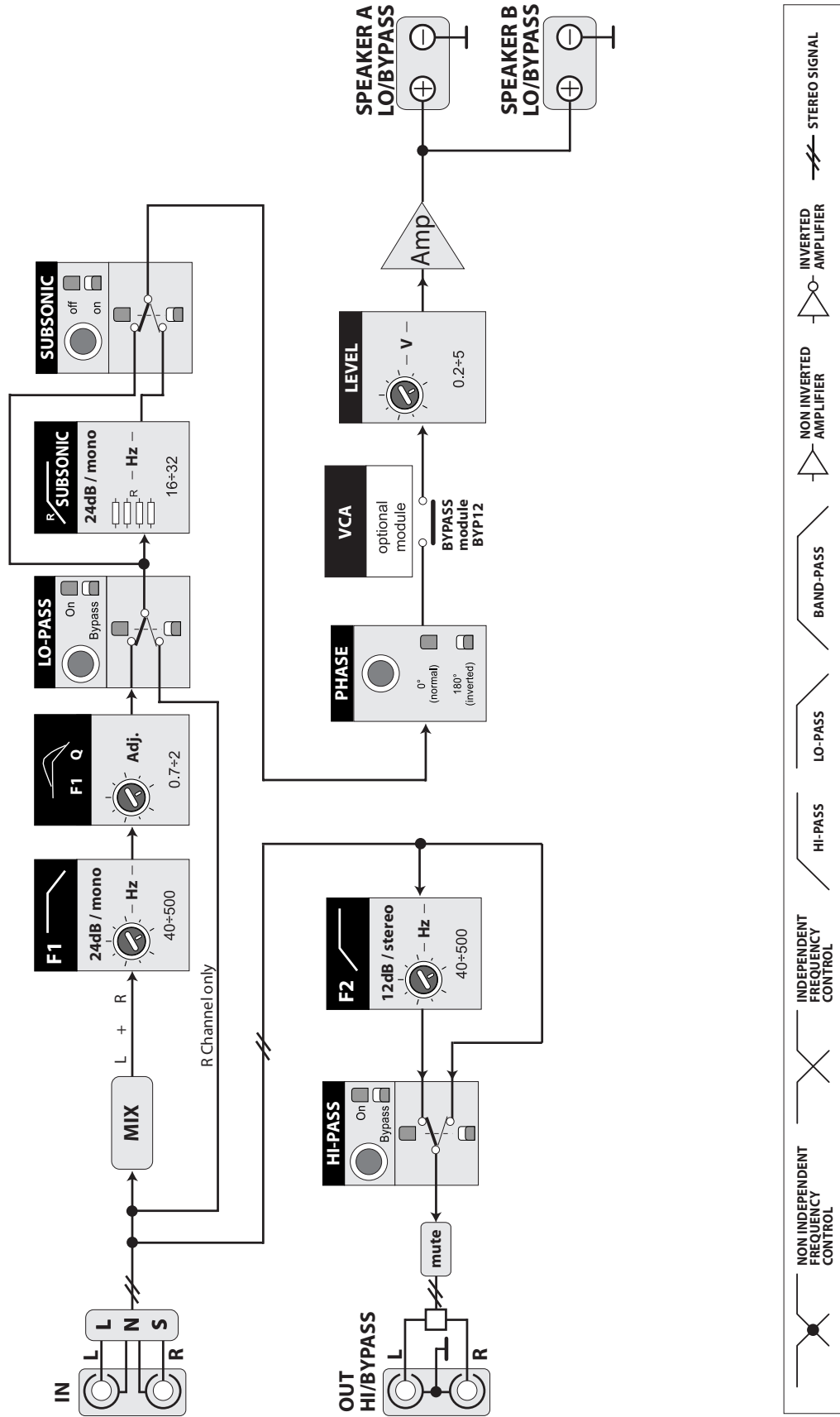
ACCESSORIES

Installation:



CONFIGURATIONS

BLOCK DIAGRAM



CONFIGURATIONS

CONFIGURATIONS TABLE

LRx 1.400 can be configured as follows:

Config. 1 = Speaker A/B (Full Range); Pre Out (Full Range)

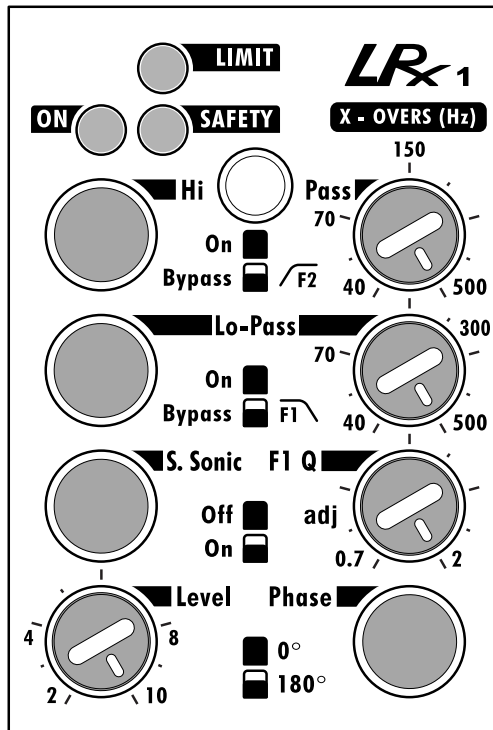
Config. 2 = Speaker A/B (Full Range); Pre Out (Hi 12 dB)

Config. 3 = Speaker A/B (Lo 24 dB); Pre Out (Full Range)

Config. 4 = Speaker A/B (Lo 24 dB); Pre Out (Hi 12 dB)

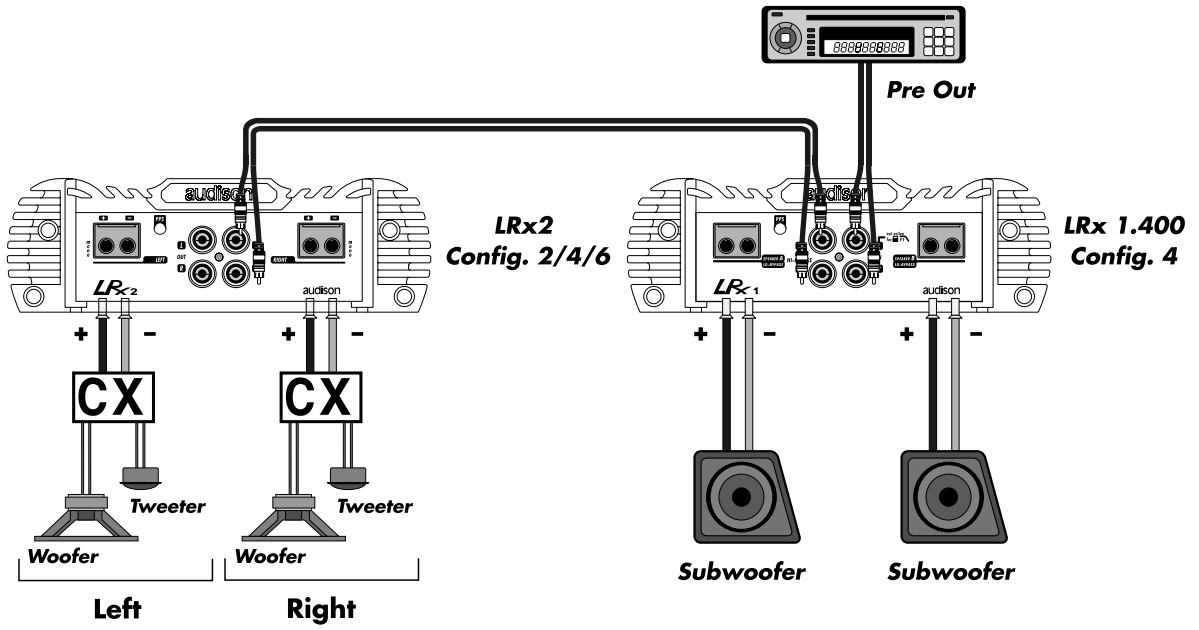
CONFIG.	SPEAKER A/B	PRE OUT	LO-PASS	HI-PASS
1			<input type="checkbox"/> BYPASS	<input type="checkbox"/> BYPASS
2			<input type="checkbox"/> BYPASS	<input checked="" type="checkbox"/> ON
3			<input checked="" type="checkbox"/> ON	<input type="checkbox"/> BYPASS
4			<input checked="" type="checkbox"/> ON	<input checked="" type="checkbox"/> ON

CONTROLS PANEL DIAGRAM



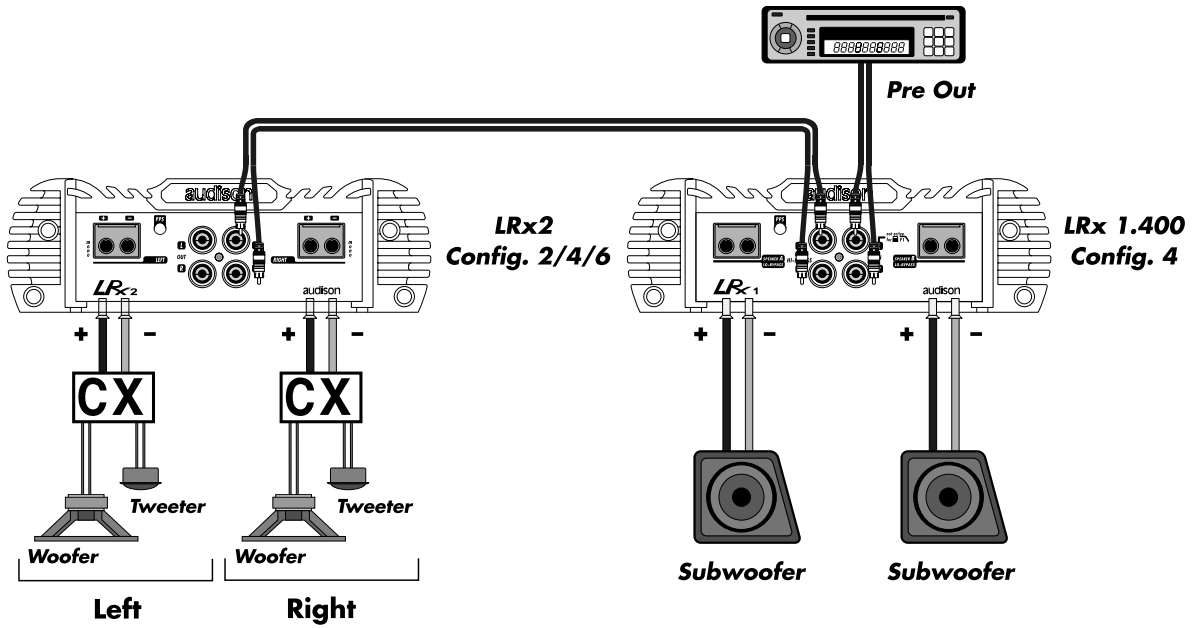
CONFIGURATION EXAMPLES

FRONT+SUBWOOFER



CX PASSIVE CROSSOVER

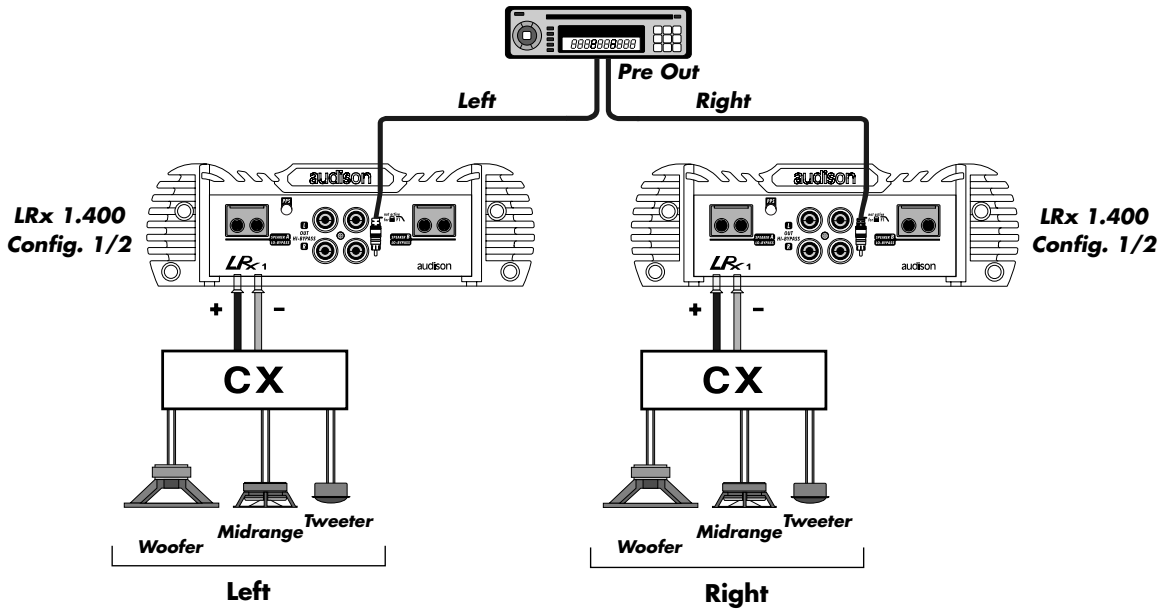
FRONT (DUAL MONO)+SUBWOOFER



CX PASSIVE CROSSOVER

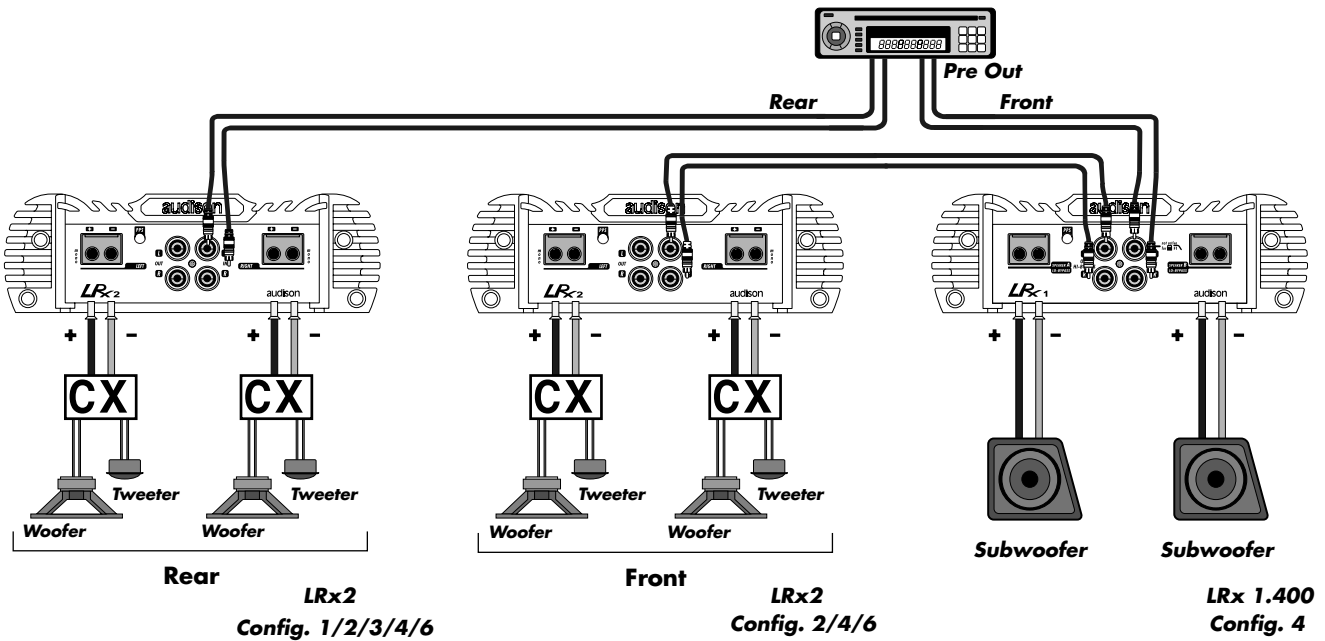
CONFIGURATION EXAMPLES

FRONT (DUAL MONO)



CX PASSIVE CROSSOVER

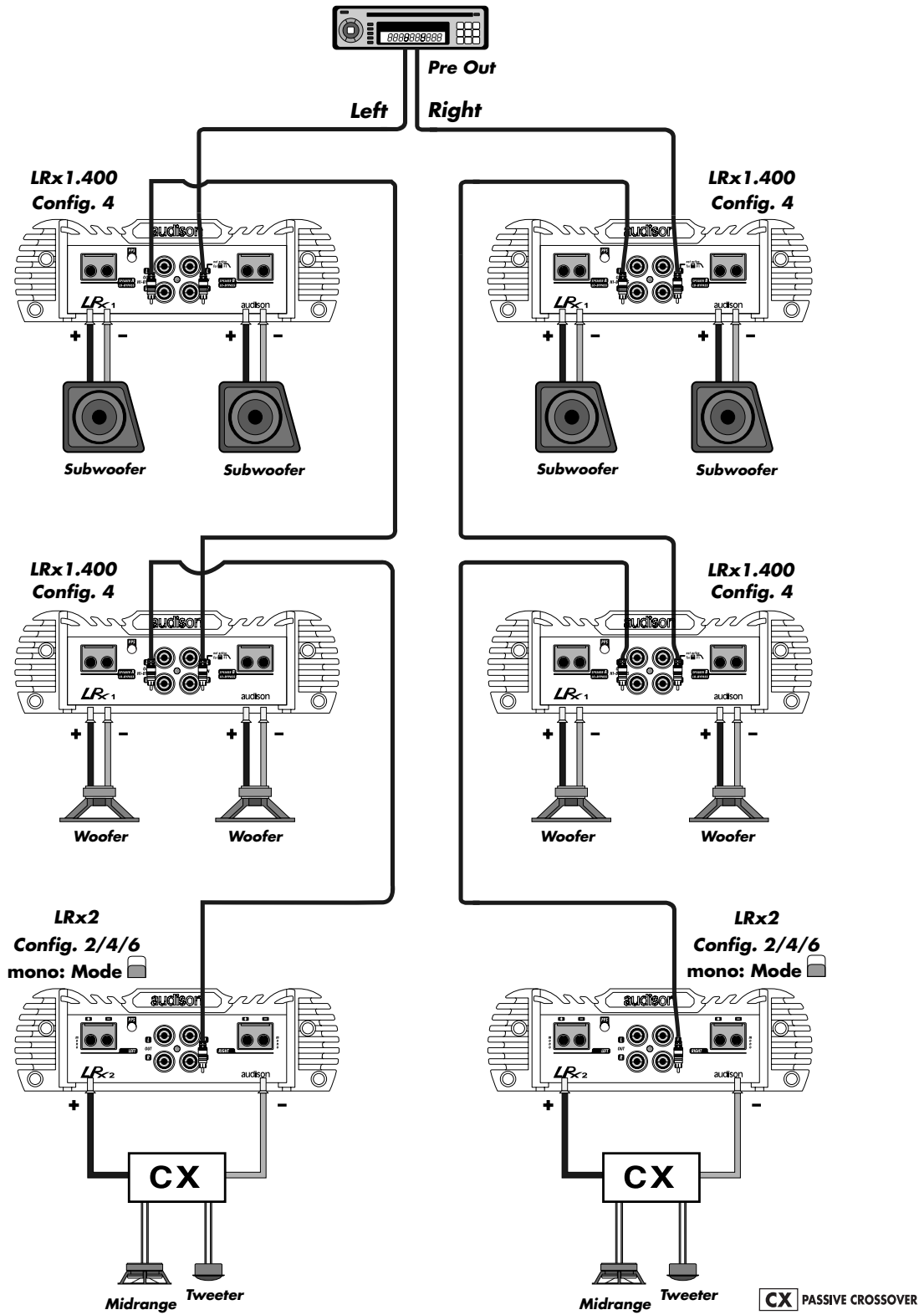
FRONT + REAR + SUBWOOFER



CX PASSIVE CROSSOVER

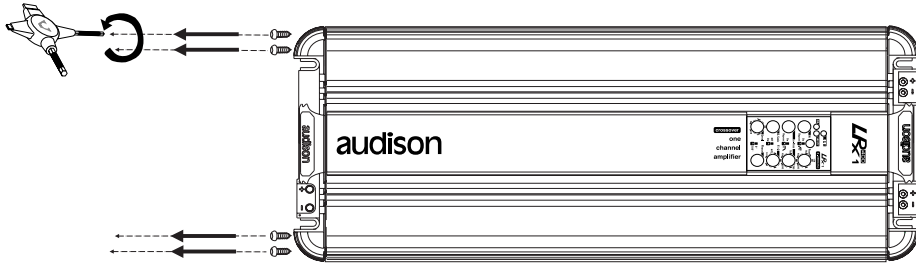
CONFIGURATION EXAMPLES

MULTICHANNEL



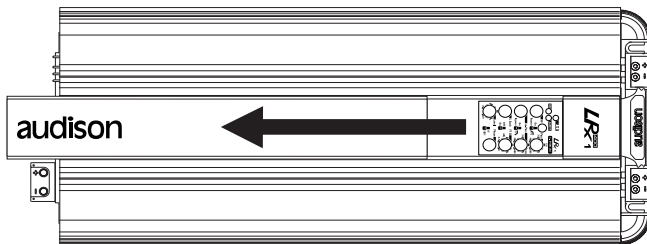
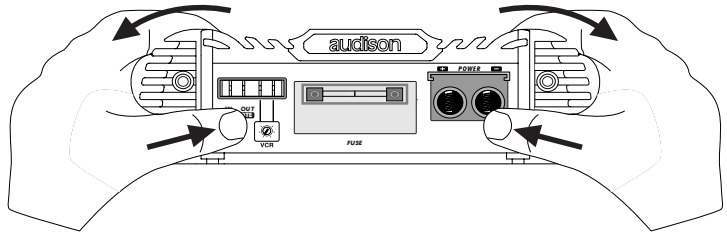
INSTALLATION

LOGO ROTATION



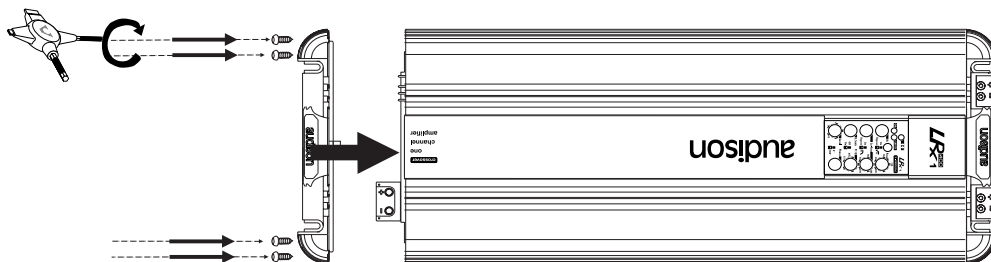
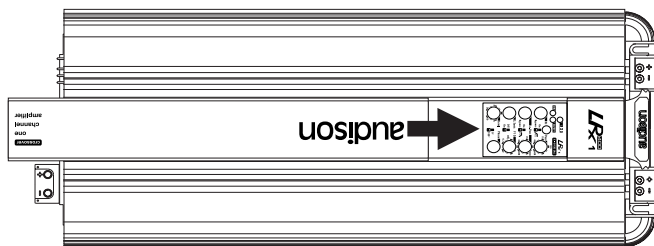
1 - Remove the transparent cover which protects controls and then the 4 screws which block the metal plate by using multispanner.

2 - Remove the plate without damaging the silkscreen printed panel which will have to stay on. We suggest that you seize both plate grips with your hands and pull them by blocking the silkscreen printed panel with your fingers against the amplifier chassis at the same time. This will permit to remove the plate from the panel without damages.



3 - Remove the strip with audison logo.

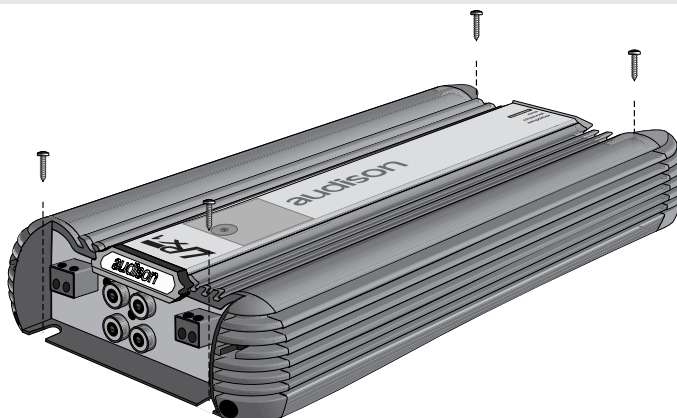
4 - Put the strip back again after turning it, so that audison logo is upside down.



5 - Mount the plate back by fixing it through the screws; then, re-assemble the transparent cover which protects controls.

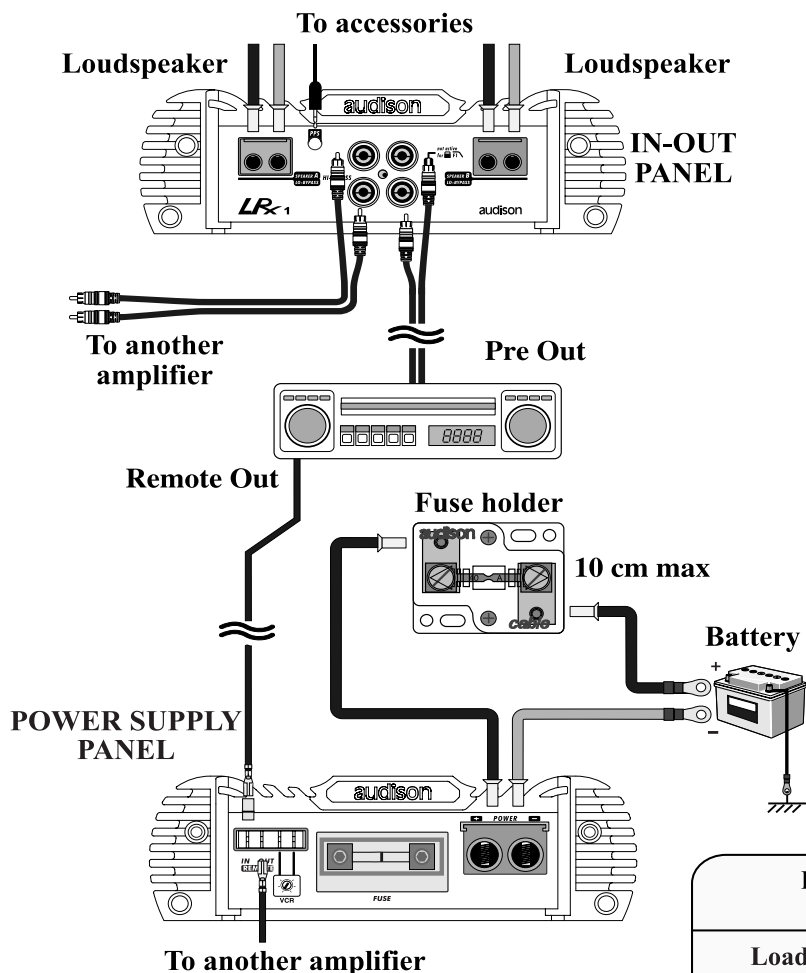
INSTALLATION

AMPLIFIER FIXING



Fix the amplifier through the self-tapping screws (4.2 x 16) given with it.

ELECTRIC CONNECTIONS



CAUTION!

For the system safer protection, we recommend the use of a strip fuse on the cable that connects the battery positive pole to the amplifier POWER (+) terminal block. This fuse has to be installed about 10 cm far from the battery; its value will have to be equal or slightly higher (+10% approx.) than consumption @13.8 VDC, according to the different configurations (see "Technical features").

It will have to be equal to the sum of the values of all fuses in case system consists of several amplifiers or in case amplifiers have several fuses.

LRx 1.400 FUSE: 60A

POWER SUPPLY CABLE SIZE Length: 4/5 m				
Load	4 Ohms		1 Ohm	
Unit of measure	mm ²	A.W.G.	mm ²	A.W.G.
LRx 1.400	5.5	7	15.1	5

INSTALLATION

audison cable PRODUCTS FOR ELECTRIC CONNECTIONS


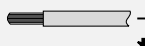


MAINCRIMP 

audison *cab*le


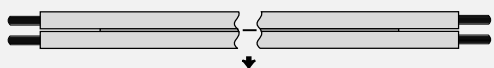
RING TERMINALS 

RECOMMENDED POWER SUPPLY CABLES

Cable must be chosen according to its length and to the system total power.

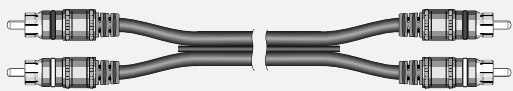
POWER SUPPLY TERMINAL BLOCKS		CABLES		BATTERY + AND GROUND	
1 Ohm					
4/2 Ohms	MAINCRIMP 8	For 7 A.W.G.	POWERFLOW 7 (red and black)	PR 62.19 R&B	RB 6.45.1G f = 6 (.24) RB 8.45.1G f = 8 (.31)
1 Ohm	MAINCRIMP 8	For 5 A.W.G.	MAINPOWER 5 (red and black)	PR 80.24 R&B	RB 6.58.1G f = 6 (.24) RB 8.58.1G f = 8 (.34)

RECOMMENDED SPEAKERS CABLES

SPEAKERS TERMINAL BLOCKS	CABLE	
		
MAINCRIMP 14	093/20	2 x 14 A.W.G.
MAINCRIMP 14	092/20	2 x 12 A.W.G.

RECOMMENDED SIGNAL CABLES

BEST series PIN-RCA / PIN-RCA extensions are available in the following sizes



BS 50	cm 50 (19.68 inch)	BS 300	cm 300 (118.11 inch)
BS 100	cm 100 (39.37 inch)	BS 400	cm 400 (157.48 inch)
BS 150	cm 150 (59.05 inch)	BS 450	cm 450 (177.16 inch)
BS 200	cm 200 (78.74 inch)	BS 500	cm 500 (196.85 inch)
		BS 600	cm 600 (236.22 inch)

Audison measurement standards

*(Power measures taken according to **audison** standard, 1998 edition)*

- 12VDC and 13.8VDC;
- 1 kHz or crossover cut-off frequency;
- 0.3% THD @ nominal power; 1% THD @ continuous power;
- Tolerance: +10%; -5%;
- Continuous power given by RMS Voltage measured on resistive load;
- The nominal power of the amplifier is measured upon a battery voltage of 12 Volts with a 4 Ohm load and with all channels in function.

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