

Crestron **AMP-2210S/3210S**
Commercial Power Amplifiers, 4/8 Ω

Operations & Installation Guide



This document was prepared and written by the Technical Documentation department at:



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Important Safety Instructions

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Use only with the cart, stand, tripod, bracket or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. 
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Disconnect power prior to connecting or disconnecting equipment.
- Do not install in direct sunlight.
- The apparatus must be installed in a way that the power cord can be removed either from the wall outlet or from the device itself in order to disconnect the mains power.
- Prevent foreign objects from entering the device.

WARNING:

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE. THE APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING. OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHOULD NOT BE PLACED ON THE APPARATUS.

WARNING:

TO PREVENT ELECTRIC SHOCK, DO NOT REMOVE COVER. THERE ARE NO USER SERVICEABLE PARTS INSIDE. ONLY QUALIFIED SERVICE PERSONNEL SHOULD PERFORM SERVICE.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:

THIS IS AN APPARATUS WITH CLASS I CONSTRUCTION. IT SHALL BE CONNECTED TO AN ELECTRICAL OUTLET WITH AN EARTHING GROUND TERMINAL.

IMPORTANT:

The AMP-2210S/3210S can be used with Class 2 output wiring.

Regulatory Compliance

As of the date of manufacture, the AMP-2210S/3210S has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.



Federal Communications Commission (FCC) Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following conditions:
(1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Industry Canada (IC) Compliance Statement

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

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

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Commercial Power Amplifiers, 4/8Ω: AMP-2210S/3210S

Introduction

Crestron® AMP-series Commercial Power Amplifiers provide a perfect combination of high output and efficiency for all types of professional audio applications. 100% Crestron engineered and built, these amplifiers are ENERGY STAR® qualified to enable organizations to fulfill their green initiatives without compromising audio performance. Advanced design features include a high efficiency amp topology with active power factor corrected power supply, delivering a generous amount of power in a space saving 1U rack-mountable chassis.

The AMP-2210S provides two channels of amplification (the AMP-3210S provides three). Each channel is rated for 210W @ 4Ω or 120W @ 8Ω, and channels 1 and 2 may be bridged together to deliver a robust 420W @ 8Ω to a single load.

The AMP-2210S and AMP-3210S are functionally identical. For simplicity within this guide, the term “AMP2210S/3210S” is used except where noted.

Features and Functions

- ENERGY STAR® qualified power amplifier
- Ultra-efficient space saving design
- Low total cost of ownership
- High output, low noise, low distortion performance
- Two or three channels, each rated 210W @ 4Ω and 120W @ 8Ω
- Channels 1 and 2 bridgeable for 420W @ 8Ω
- Individual channel power control via jumper or remote contact
- Auto power down after 30 minutes of no signal
- Instant auto power on when a signal is detected
- No inrush current during power up
- Over current and DC offset protection per output
- Thermal protection on the power supply and each channel
- Front panel signal, clip, and fault indicators per channel
- Professional balanced inputs
- Detachable terminal block connectors
- Rear panel ±10 dB input level controls
- Convection cooled - no noisy fans
- Single space 1U rack mountable
- Lightweight and under 11 inches deep
- Universal power supply with active power factor correction

ENERGY STAR® Qualified

Their ultra-efficient design allows the AMP-2210S/3210S to meet demanding ENERGY STAR qualification requirements, affording a cost reducing solution for boardrooms, auditoriums, and other commercial systems. Auto power down places the amplifier into a low power standby state if no input signal is detected for 30 minutes. The amplifier quickly powers back on the instant an input signal is detected. In addition, each amp channel can be independently enabled or disabled via jumpers or remote contacts, reducing power consumption by shutting down individual channels when they are not needed. Whether switched remotely or through an AC power controller, the AMP-2210S/3210S draw no added inrush current during power up, reducing AC circuit requirements and potentially eliminating the need for extra power sequencing equipment.

Professional System Integration

The AMP-2210S/3210S include professional balanced inputs with rear-panel ± 10 dB input level adjustments to assure compatibility with a wide range of audio sources. Remote power control is enabled for each channel using external contact closures, switches, or control system relays. All input, output, and remote control connections are facilitated via detachable screw terminal connectors to simplify installation and servicing.

Cool and Compact

The AMP-2210S/3210S features a durable, lightweight chassis that may be placed on a shelf, or rack-mounted using the rack ears provided. At only one rack space high and under 11 inches (280 mm) deep, it is ideal for installations requiring a lot of power in a limited space. Their efficient, cool running design gives off substantially less heat than comparably rated amplifiers. Convection cooling means there are no noisy fans, allowing the AMP-2210S/3210S to be installed in a boardroom lectern or credenza without affecting noise levels.

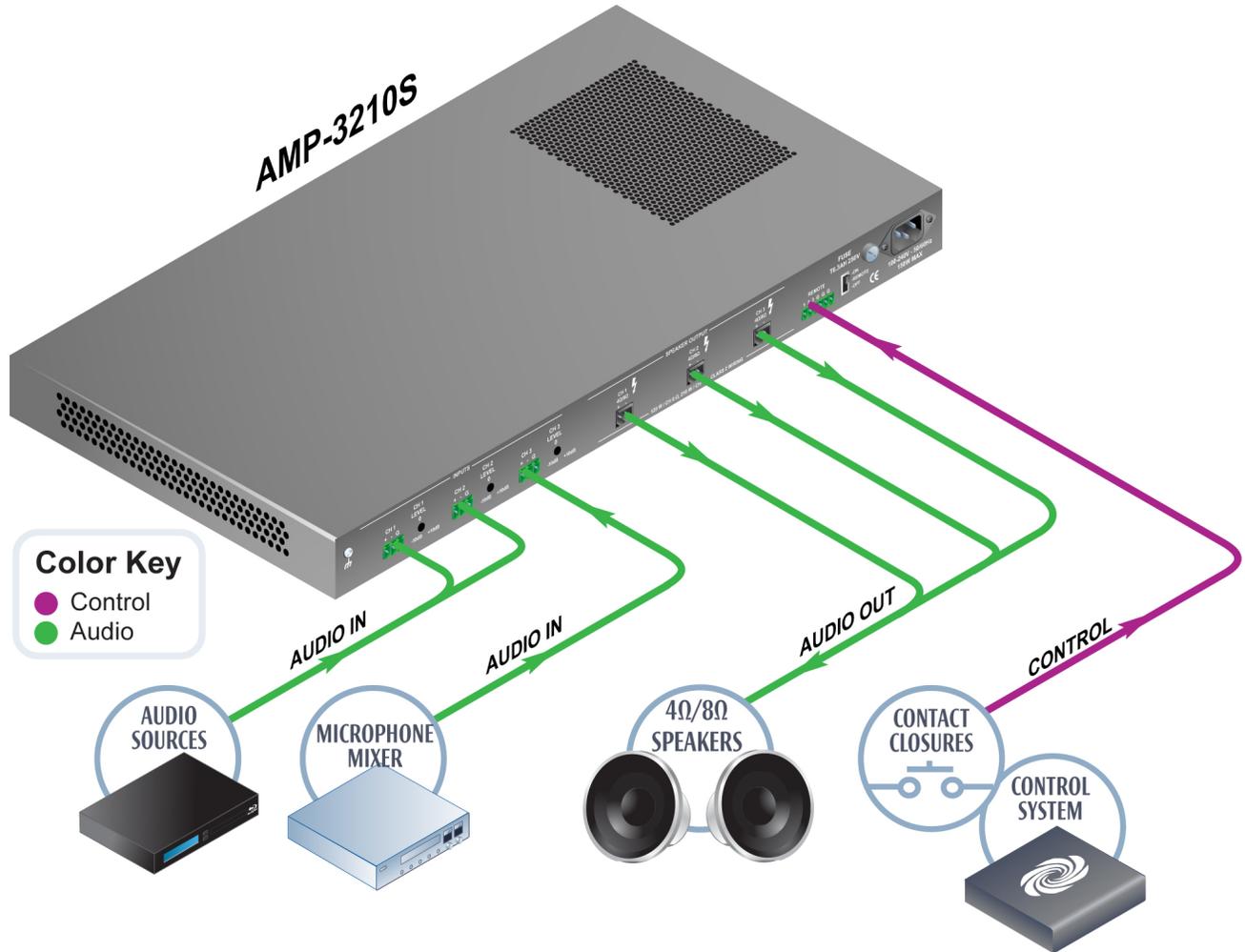
Rugged and Dependable

All AMP-series amplifiers are designed for ultimate dependability in a wide range of commercial environments. Built-in over current and DC offset protection on each channel helps prevent damage to the amplifier and speakers due to external or internal faults. Discrete thermal protection is also provided on each channel and the power supply. Front panel indicators are provided for each channel to show signal presence, clipping, and fault conditions.

Applications

The following diagram shows an AMP-2210S/3210S in a basic application.

AMP-2210S/3210S in a Basic Application (AMP-3210S Shown)



Specifications

Specifications for the AMP-2210S/3210S are listed in the following table.

AMP-2210S/3210S Specifications

SPECIFICATION	DETAILS
Audio	
Typical of mono amplifier channels	
Input Signal Type	Balanced or unbalanced analog line level
Output Signal Type	4/8 Ohms
Output Power	120 Watts at 8 Ohms 210 Watts at 4 Ohms 420 Watts at 8 Ohms bridged

(Continued on following page)

AMP-2210S/3210S Specifications (Continued)

SPECIFICATION	DETAILS
Audio Typical of mono amplifier channels (Continued) Damping Factor Protection Frequency Response THD S/N Ratio Crosstalk Gain Input Sensitivity Input Detection Threshold Input Level Adjustment	>100 Over current, over/under voltage, over temperature, DC offset 20 Hz to 20 kHz \pm 0.5 dB 0.05% at 1kHz at full rated power at 4/8 Ohms, 8 Ohms bridged, or 70/100 Volts; 0.1% at 20 Hz to 20 kHz, 120 W at 8 Ohms; 0.2% at 20 Hz to 20 kHz, 210 W at 4 Ohms; 0.1% at 20 Hz to 20 kHz, 420 W at 8 Ohms bridged; >103 dB, A-weighted >70 dB @ 1kHz 23 dB with INPUT LEVEL control set at 12 o'clock nominal position 2.22 V _{rms} for rated output power with INPUT LEVEL control set at 12 o'clock nominal position 40 mV RMS @ 1 kHz \pm 10 dB from nominal
Power Requirements Main Power Power Consumption, AMP-2210S Power Consumption, AMP-3210S	100-240 Volts AC, 50/60 Hz 62 Watts @ 8 Ohms, all channels driven at 1/8 power; 88 Watts @ 4 Ohms, all channels driven at 1/8 power; 26 Watts, all channels idle; <1 W in standby 85 Watts @ 8 Ohms, all channels driven at 1/8 power; 126 Watts @ 4 Ohms, all channels driven at 1/8 power; 32 Watts, all channels idle; <1 W in standby
Environmental Temperature Humidity Heat Dissipation, AMP-2210S	41° to 104° F (5° to 40° C) 10% to 90% RH (non-condensing) 110 BTU/Hr @ 8 Ohms, all channels driven at 1/8 power; 121 BTU/Hr @ 4 Ohms, all channels driven at 1/8 power; 89 BTU/Hr, all channels idle; <3.4 BTU/Hr in standby

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AMP-2210S/3210S Specifications (Continued)

SPECIFICATION	DETAILS
Environmental (Continued) Heat Dissipation, AMP-3210S	137 BTU/Hr @ 8 Ohms, all channels driven at 1/8 power; 162 BTU/Hr @ 4 Ohms, all channels driven at 1/8 power; 110 BTU/Hr, all channels idle; <3.4 BTU/Hr in standby
Enclosure Chassis Front Panel Mounting	Metal with black finish, vented top and sides, convection cooled Metal, black finish with polycarbonate label overlay Freestanding or 1U 19-inch rack-mountable (adhesive feet and rack ears included)
Dimensions Height Width Depth	1.70 in (44 mm) 17.28 in (439 mm), 19.0 in (483 mm) with rack ears 10.34 in (263 mm)
Weight AMP-2210S AMP-3210S	8.1 lbs (3.7 kg) 8.3 lbs (3.8 kg)

Physical Description

This section provides information on the connections, controls and indicators available on your AMP-2210S/3210S.

AMP-2210S Physical View (Front)



AMP-2210S Physical View (Rear)



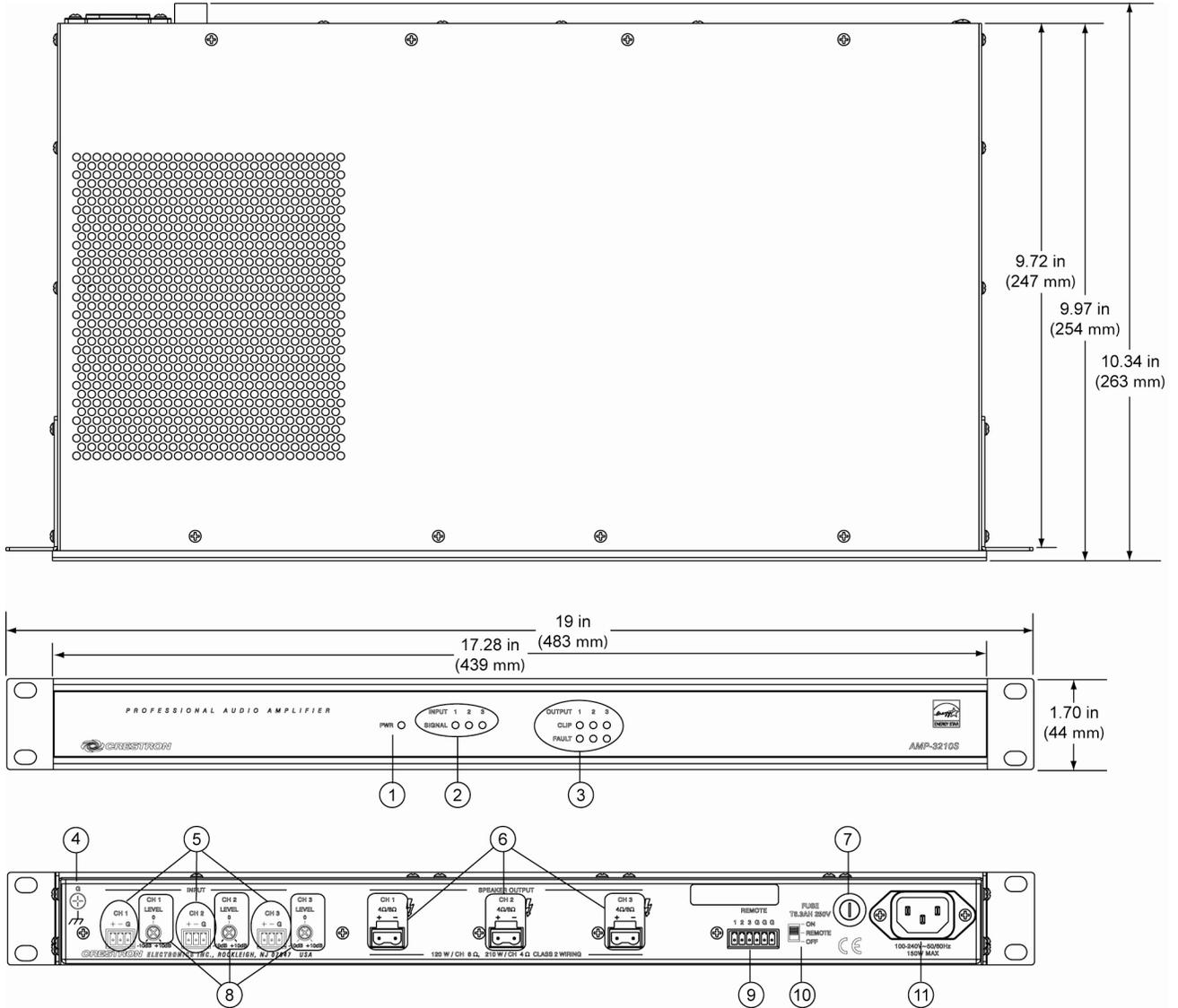
AMP-3210S Physical View (Front)



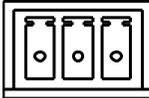
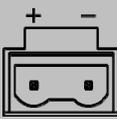
AMP-3210S Physical View (Rear)



AMP-2210S/3210S Overall Dimensions (AMP-3210S Shown)

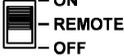


AMP-2210S/3210S Connectors, Controls & Indicators

#	CONNECTORS*, CONTROLS & INDICATORS	DESCRIPTION
1	PWR LED	(1) Green LED indicates power on; amber indicates standby
2	INPUT 1 - 3 LED	(3) Green LEDs (2 on 2210S) indicates signal presence on each corresponding channel NOTE: The LEDs are inactive in standby mode
3	OUTPUT 1 – 3, CLIP/FAULT	(3) Amber LEDs (2 on 2210S) indicate a clipping condition on each corresponding channel; (3) Red LEDs (2 on 2210S) indicate over temperature, over current, over or under power supply voltage, or DC offset condition on each corresponding channel.
4	G 	6-32 screw, chassis ground lug
5	INPUT CH 1 - 3 + - G 	(3) 3-pin 3.5mm detachable terminal blocks (2 on 2210S); Balanced/unbalanced line level; Input level: 5.3 V _{rms} maximum with INPUT LEVEL control set at minimum position; Input impedance: 24k Ohms balanced, 12k Ohms unbalanced; For unbalanced input, connect – and G pins to signal return of source; For balanced input, connect shield to G , positive signal to +, negative signal to –
6	SPEAKER OUTPUT CH1 – 3 	(3) 2-pin 7.62 mm 15A detachable terminal blocks (2 on 2210S); 4Ω/8Ω power amplifier outputs; Wire size: Terminals accept up to 14 AWG
7	FUSE T6.3AH 250V 	5 x 20 mm, 250V, 6.3AH, time lag, high rupture rated
8	INPUT CH 1 – 3 LEVEL 0  -10dB +10dB	(3) Rotary input boost/attenuate adjustments (2 on 2210S) with center detent at nominal
9	REMOTE 1 2 3 G G G 	(1) 6-pin 3.5 mm detachable terminal block; Provides (3) remote control inputs (2 on 2210S); Enables independent power control of each channel via local jumpers or remote contact closures; Inputs may be safely paralleled for global control

(Continued on following page)

AMP-2210S/3210S Connectors, Controls & Indicators (Continued)

#	CONNECTORS*, CONTROLS & INDICATORS	DESCRIPTION
10	ON/REMOTE/OFF 	(1) 3-position slide switch; Selects between all channels powered on, off, or remote controlled
11	110-240V~50/60Hz 120W MAX 	(1) IEC C14 male chassis plug, main power input; Mates with removable power cord (included)

* Interface connectors for **INPUT**, **SPEAKER OUTPUT**, and **REMOTE** ports are provided with the unit.

Setup

Installation

Ventilation

The AMP-2210S/3210S should be used in a well-ventilated area. The venting holes should not be obstructed under any circumstances.

To prevent overheating, do not operate this product in an area that exceeds the environmental temperature range listed in the table of specifications. Consider using forced air ventilation and/or incrementing the spacing between units to reduce overheating. Consideration must be given if installed in a closed or multi-unit rack assembly since the operating ambient temperature of the environment may be greater than the room ambient temperature. Contact with thermal insulating materials should be avoided on all sides of the unit.

Rack Mounting

The AMP-2210S/3210S can be mounted in a rack or stacked with other equipment. Two “ears” are provided with the AMP-2210S/3210S so that the unit can be rack mounted. These ears must be installed prior to mounting. Complete the following procedure to attach the ears to the unit. The only tool required is a #1 or #2 Phillips screwdriver.

WARNING: To prevent bodily injury when mounting or servicing this unit in a rack, take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

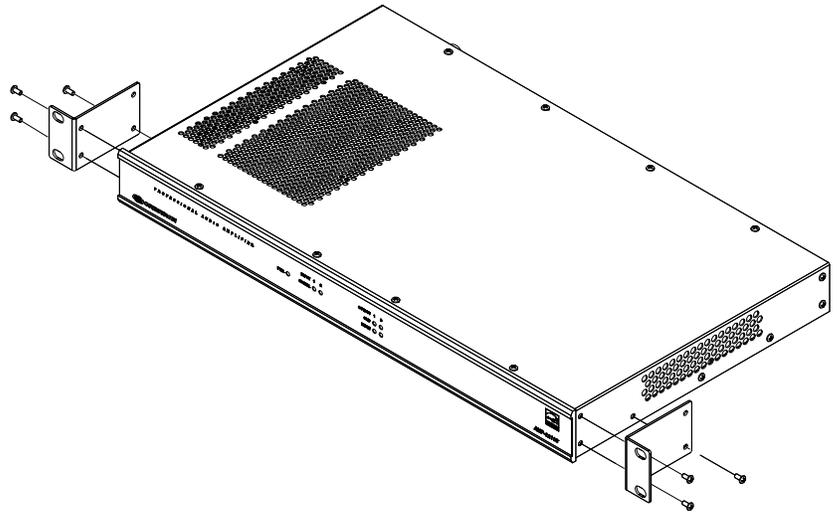
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

NOTE: If rack mounting is not required, rubber feet are provided for tabletop mounting or stacking. Apply the feet near the corner edges on the underside of the unit.

NOTE: Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

To install the ears:

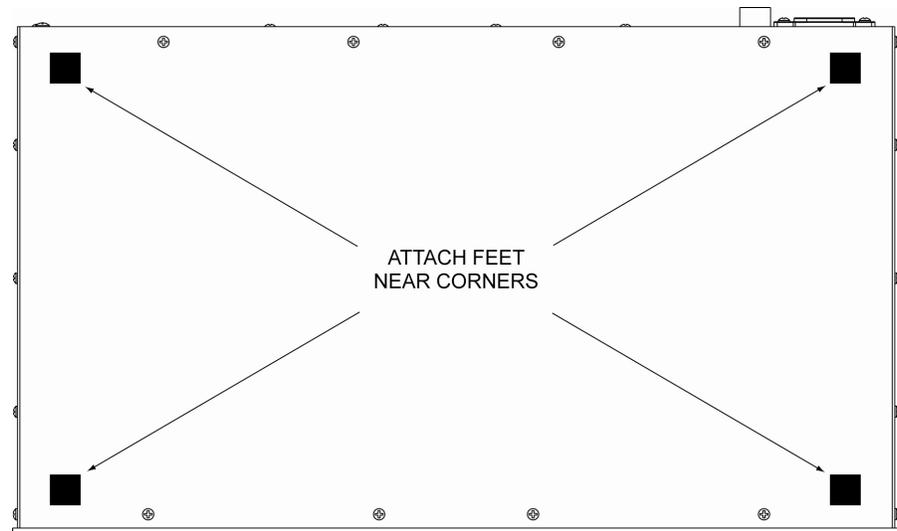
1. There are screws that secure each side of the AMP-2210S/3210S top cover. Using a #1 or #2 Phillips screwdriver, remove the three screws closest to the front panel from one side of the unit. Refer to the diagram following step 3 for a detailed view.
2. Position a rack ear so that its mounting holes align with the holes vacated by the screws in step 1.
3. Secure the ear to the unit with three screws from step 1, as shown in the following diagram.

Ear Attachment for Rack Mounting

4. Repeat procedure (steps 1 through 3) to attach the remaining ear to the opposite side.

Stacking

Four “feet” are provided with the AMP-2210S/3210S so that if the unit is not rack mounted, the rubber feet can provide stability when the unit is placed on a flat surface or stacked. These feet should be attached prior to the hookup procedure. Refer to the following illustration for placement of the feet.

Foot Placement for the AMP-2210S/3210S

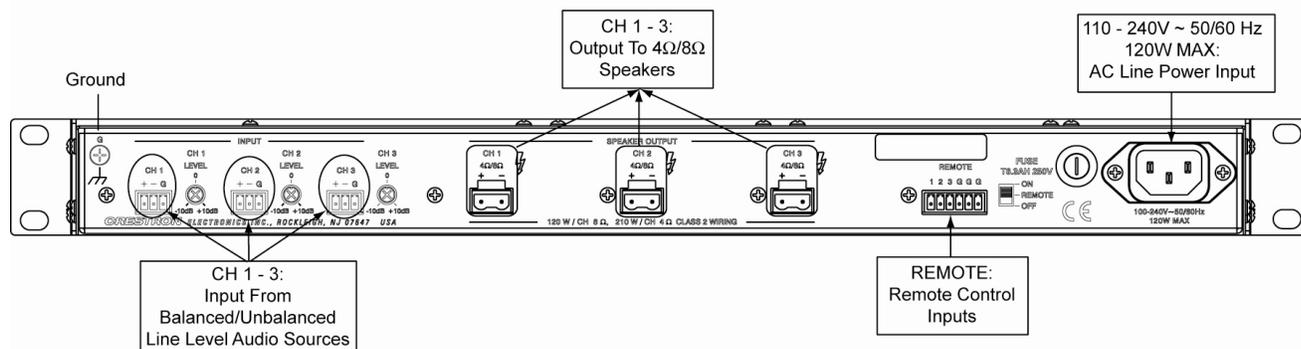
NOTE: No more than three AMP-2210S/3210S units should be stacked.

Hardware Hookup

Connect the Device

Make the necessary connections as called out in the illustration that follows this paragraph. Apply power after all connections have been made.

Hardware Connections for the AMP-3210S



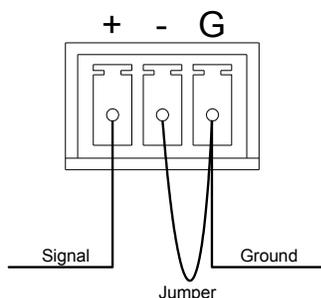
NOTE: Ensure the unit is properly grounded by connecting the chassis ground lug to an earth ground (building steel).

NOTE: To prevent overheating, do not operate this product in an area that exceeds the environmental temperature range listed in the table of specifications.

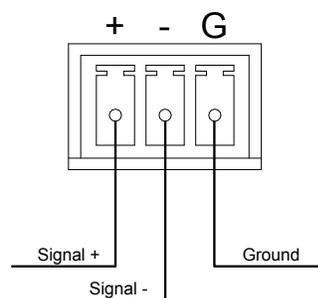
Connecting Audio Sources

The AMP-2210S/3210S can receive balanced or unbalanced audio input signals. Refer to the following illustrations when connecting balanced and unbalanced sources to the input connectors.

Wiring for Unbalanced Audio



Wiring for Balanced Audio



Fuse Replacement

If the AMP-2210S/3210S does not power up when it is plugged into an AC outlet, the fuse may need to be replaced. The fuse holder is located on the rear panel. To replace the fuse:

CAUTION: Use only time lag type fuses, T6.3AH / 250 Volts. Failure to do so may cause damage to the AMP-2210T/3210T/2210HT.

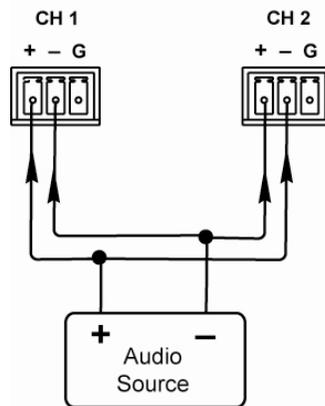
1. Disconnect power to the AMP-2210S/3210S.
2. Use a flat head screwdriver to push in the fuse holder.
3. While pushing in the fuse holder, turn screwdriver counterclockwise until the fuse holder pops out.

4. Remove the fuse from the fuse holder and insert a new fuse.
5. Insert the fuse holder in the AMP-2210T/3210T/2210HT.
6. Push in the fuse holder with a flat head screwdriver. While pushing in the fuse holder, turn the screwdriver clockwise until the fuse holder sets into place.
7. Push in the fuse holder a little further and turn the screwdriver clockwise until the fuse holder locks in place.
8. Connect power to the AMP-2210T/3210T/2210HT.

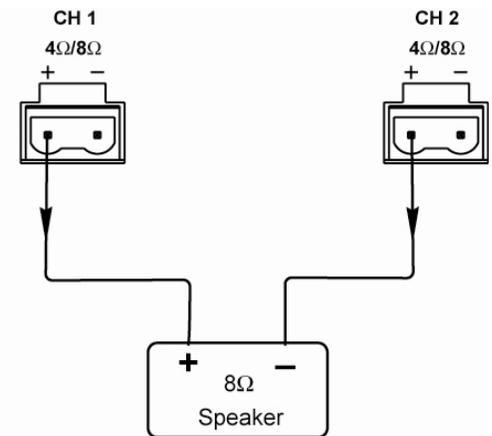
Bridging Inputs/Outputs

Channels 1 and 2 can be bridged to provide a more robust 420W @ 8Ω to a single load. To bridge channels 1 and 2, refer to the following illustrations.

Bridging Audio Input Channels



Bridging Speaker Output Channels



NOTE: The **INPUT LEVEL** controls for both channels must be set to the same level.

NOTE: The minimum allowable load impedance in bridged mode is 8 Ohms.

NOTE: When operating in bridged mode, the **CLIPPING** and **FAULT** LEDs for each channel continue to operate independently.

Operation

Ensure that the procedures and instructions given in “Setup” on page 9 have been completed, and then do the following:

- Set all **INPUT CH LEVEL** knobs to their center detent position. These can be adjusted as necessary to balance the sound between channels or to accommodate different audio sources.
- Verify that the **REMOTE** selection switch is set appropriately:
 - ⇒ ON = all channels are turned on
 - ⇒ REMOTE = channels are activated remotely
- Check the front panel LEDs to ensure that power is applied and that a signal is present on each appropriate channel.
- If an **OUTPUT CLIP** LED is on (amber), use the corresponding **INPUT CH LEVEL** knob to reduce the signal level to eliminate the clipping condition.
- If an **OUTPUT FAULT** LED is on (red), eliminate the cause of the fault condition before continuing.

Problem Solving

Troubleshooting

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

AMP-2210S/3210S Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
PWR LED does not illuminate	AMP-2210S/3210S is not receiving power	Verify that the AMP-2210S/3210S is connected to an AC outlet. Check the fuse.
Hum on audio	Grounding problem	Connect chassis to earth ground.
Audio is distorted or not present at speakers	Audio input cables loose or not connected.	Verify that the input cables are connected to the appropriate input ports.
	Room speaker wires loose or disconnected.	Verify that the speaker wires are connected to the appropriate output ports.

Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling Crestron at 1-888-CRESTRON [1-888-273-7876]. For assistance in your region, please refer to the Crestron Web site (www.crestron.com) for a listing of Crestron worldwide offices.

You can also log onto the online help section of the Crestron Web site (www.crestron.com/onlinehelp) to ask questions about Crestron products. First-time users will need to establish a user account to fully benefit from all available features.

Future Updates

As Crestron improves functions, adds new features and extends the capabilities of the AMP-2210S/3210S, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron Web site periodically for manual update availability and its relevance. Updates are identified as an “Addendum” in the Download column.

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact an authorized CRESTRON dealer. Only authorized CRESTRON dealers may contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number and return address.
2. Products may be returned for credit, exchange or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touch screen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from CRESTRON or an authorized CRESTRON dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

CRESTRON shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended or if it has been subjected to misuse, accidental damage, modification or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced or removed.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall CRESTRON be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. CRESTRON is not liable for any claim made by a third party or made by the purchaser for a third party.

CRESTRON shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, CRESTRON makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supersedes all previous warranties.

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Operations & Installation Guide – DOC. 7251A
(2031866)
09.11
Specifications subject to
change without notice.