

Owner's Manual

Model

VSi60

Stereo Integrated Amplifier

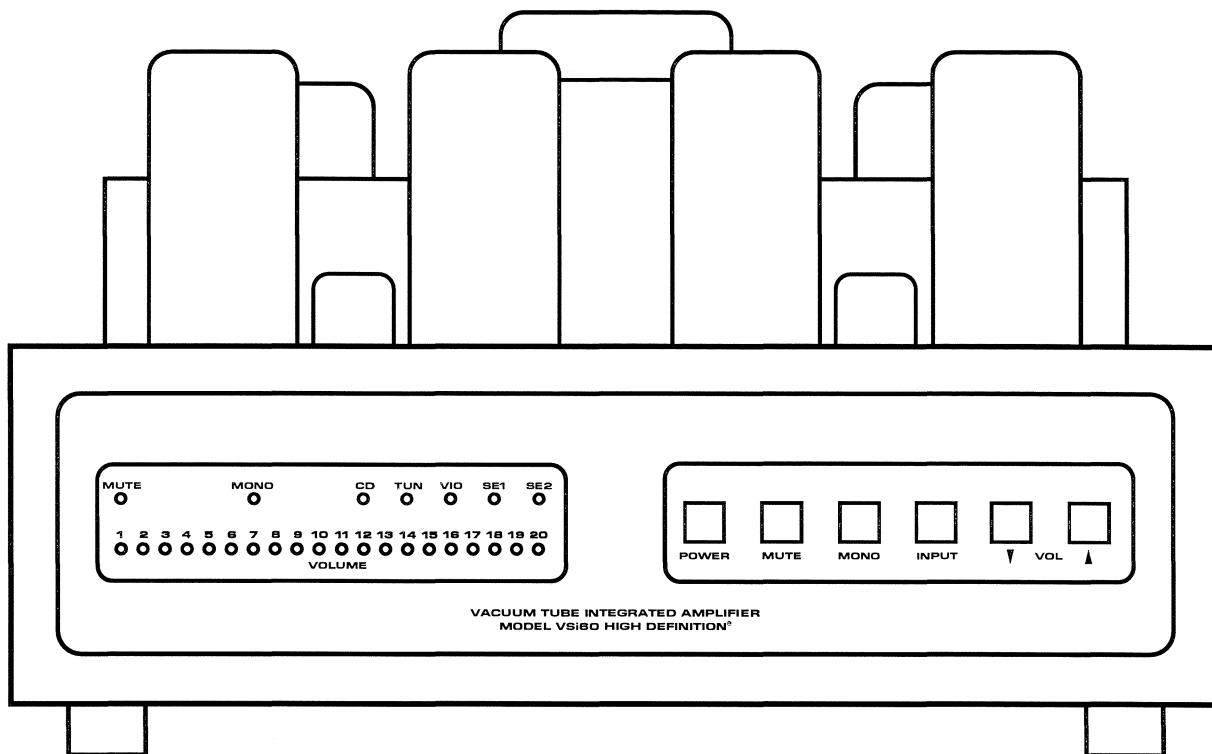
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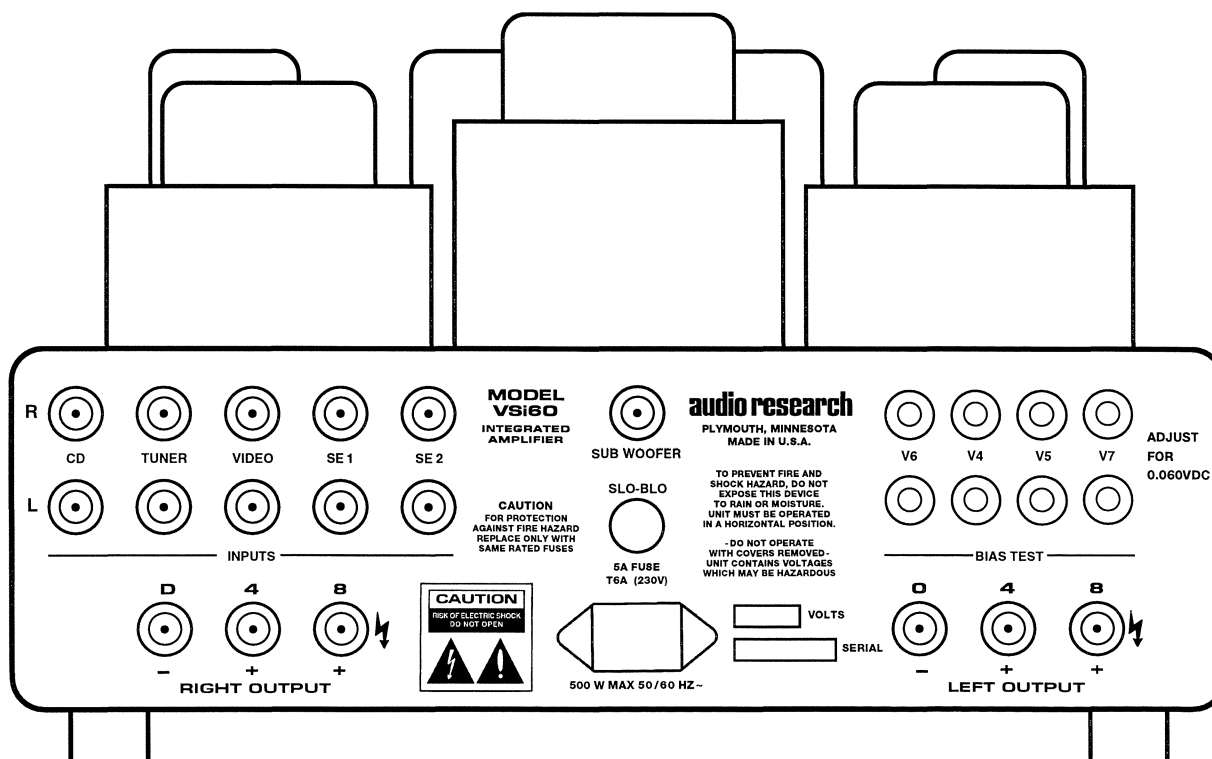
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Preface

Please take time to carefully read and understand the following instructions before you install or attempt to operate this equipment. Becoming familiar with the product and its correct operating procedures will help assure you of maximum musical enjoyment and reliable operation. The effort you invest now will be well rewarded in the years ahead.

Packaging

Save all the packaging in a dry place. Your Audio Research amplifier is a precision electronic instrument and should be properly cartoned any time shipment is made. Because of its weight, it is highly probable that the unit will be damaged during shipment if repackaged in cartoning other than that designed for the unit.

You may not have occasion to return the unit to the factory for service, but if that should prove necessary, or other occasion to ship it occurs, the original packaging may save your investment from unnecessary damage, delay and expense.

Unpacking

The VSi60 is packed in a heavy-duty carton with special foam inserts for maximum protection. Because of the weight of the unit and because it is a precision electronic instrument, it is necessary to take reasonable care during unpacking and preparation for use.

Open the carton with a small knife to carefully slit the taped edges of the top flaps. Fold the flaps to the sides and remove the tubes packed in foam blocks. Roll the unit in the carton upside down on a soft surface and lift the carton off and turn the unit right side up, then remove the foam inserts. Carefully remove the plastic wrap. Keep all foam inserts and store the carton system for future use.

Accessories

1 – Plastic screwdriver for bias adjustments

User replaceable spare fuses include:

1 – 5 Amp MDQ slo-blo with 120V units or 100V units

1 – T4A 250V slo-blo with 220V/240V units

Warnings

1. Do not touch hot tubes. Keep away from children.
2. To prevent fire or shock hazard, do not expose your VSi60 to rain or moisture.
3. This unit contains voltages which can cause serious injury or death. Do not operate with covers removed. Refer servicing to your authorized Audio Research dealer or other qualified personnel.

4. The 14-gauge, 3-conductor detachable power cord on your VSi60 is equipped with a standard 3-prong grounding plug. If used normally, it will provide a safe earth ground connection of the chassis. Refer to the section on "AC Power Connections" for detailed information.
5. For continued protection against fire hazard, replace fuses only with the same type and rating of fuses as specified.

Preparation for Use

Your VSi60 amplifier is shipped with the vacuum tubes packed in foam blocks. These must be unpacked and installed before you attempt to operate the amplifier. Included are two matched pair of 6550 output tubes, and two 6H30 dual triodes used in the input stage. Proceed according to the following instructions.

1. Carefully remove each vacuum tube from its protective foam and match its location "V" number (written on the base of the tube) to the "V" number printed next to each socket. Firmly seat each tube in its matching socket, taking care to "key" the tube pins to the socket holes. Retain the foam blocks with other packing materials for possible future use.
2. If you are using the optional tube cover, be sure the VSi60 is first turned off and then remove the top plate with the phillips screwdriver provided with the tube cover. Install the tube cover in place of the top plate, using the original top plate screws.

Description of Controls

VOLUME CONTROL [VOL]: Pressing the down [▼] or up [▲] button decreases or increases the volume level.

Note that the VSi60 has 70 individual steps across the volume control adjustment range and 20 numbered volume LEDs. The corresponding LED position that is illuminated for a given volume control setting serves as a general level indicator and will remain lit for several individual adjustment steps before an adjacent LED illuminates.

INPUT SELECTOR SWITCH: Allows selection of any of five single-ended input sources [labeled, CD, TUN (tuner), VID (video), SE1 and SE2]. Pressing the Input selector switch steps through each input as indicated by LED illumination.

POWER ON/OFF SWITCH: Supplies power from AC wall outlet to VSi60 when in "on" position (indicated by LED illumination).

Note: If you turn off the VSi60 wait at least two minutes before turning it on again. This brief cool down period will reduce stress on the output tubes and potential damage to them.

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In the event of loss of power to the VSi60 while it is turned on, the Power on/off switch will default to the "off" position when power is restored. If the VSi60 is unplugged, the Power on/off switch will default to the "off" position when it is plugged in again. In each instance you must manually select the Power switch "on" position to begin operation of the unit.

Should you lose power to the VSi60 or unplug it from its power receptacle, and on initial power-up, it will default to muted minimum volume level on the CD input and stereo mode. After subsequent turn-on by the Power on/off switch, the VSi60 will return to the previously used settings, but in the "mute" position.

Note: Audio Research does *not* recommend leaving your VSi60 "on" 24 hours a day as is the custom of some audiophiles to achieve maximum sonic performance on demand. While this is often recommended for solid-state equipment, Audio Research does not recommend this procedure for vacuum tube power amplifiers. (2,000 hours of tube life will pass by in 84 days!)

MUTE/OPERATE SWITCH: This switch should always be activated between listening uses or before switching inputs, in addition to turning the Volume control down. These two simple precautions will prevent inadvertent misuse of your VSi60 and help protect your power amplifier(s) and speakers from unexpected transient signal pulses. In "operate" position (indicated by unlit Mute LED), this switch allows the signal to pass normally to the outputs.

CAUTION: Do not turn up the Volume control beyond normal listening levels when the VSi60 is in the "mute" position. Always turn the Volume control down when changing program sources, even when it is muted.

OPERATE/MUTE CIRCUIT LED: Note that for approximately 30 seconds after start-up the Mute LED will flash until the automatic muting cycle is completed. None of the front panel controls except for the Power on/off switch are operable during the automatic muting cycle. Upon completing the automatic muting cycle, the unit will then be in the manual "mute" position (indicated by illuminated Mute LED) until the "operate" position is manually selected by pressing the mute button once (so that the Mute LED extinguishes).

RESETTING CONTROLS: To avoid discharging static to the VSi60 controls, contact another surface (such as a metal equipment rack) to drain away the charge before touching the VSi60. If a static charge should "lock up" the micro-

processor making the front panel controls inoperable, unplug the VSi60 from its power receptacle. After waiting two minutes, plug in the VSi60 and power it up with the rest of the system; the controls should resume normal operation. If the problem persists, contact your dealer or Audio Research Customer Service at 763-577-9700.

STEREO/MONO SWITCH: Mono operation is indicated by the lit Mono LED on the VSi60 front panel; when the Mono LED is unlit the VSi60 is in stereo mode.

USE OF REMOTE CONTROL UNIT: All front-panel functions are duplicated on the remote control unit for the VSi60. The life of the batteries in the remote control is about 1 year. For replacement use only batteries of the type RO3, UM4 or AAA.

Rear Panel Connections

INPUT CONNECTORS: All five sets of SE inputs are clearly marked to indicate use.

SUBWOOFER OUTPUT CONNECTOR: This summed mono output signal is for connection to the input of a power amplifier driving a subwoofer (such as a powered subwoofer).

- 6 – Output binding posts (+) and (-), L & R, for 4 or 8 ohm speaker connection
- 1 – Power line cord inlet
- 1 – Power line fuse holder
- 4 – Pairs bias test jacks, one pair for each output tube

Installation

To insure normal component life and safe operation this unit *must be operated only in a horizontal (upright) position*. Adequate air flow and proper cooling thereby can occur only if there is no restriction *below, behind and above* the unit.

The four special non-marring elastomer feet provide adequate spacing only from a smooth, hard surface. *Never operate the unit while it is sitting on a surface such as a rug or carpet.*

If the unit is to be operated in an enclosed equipment cabinet, an exhaust fan is desirable so as not to operate the VSi60 in overheated ambient air. The "ambient" operating temperature should never exceed 120°F or 49°C. Improper installation will cause premature tube failure and will affect your warranty, as well as the service life of the unit.

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It is normal for a vacuum tube power amplifier to run quite warm, and if used for prolonged periods, hot to the touch. All components within are, however, operated at safe, conservative levels and will not be improperly affected thereby, providing the requirements outlined above are adhered to.

IMPORTANT: Use the best available speaker wires and interconnects. Audio Research cannot emphasize this enough. As better components and systems are developed, it becomes increasingly important to avoid the limitations of inferior system interconnections.

It is important sonically that your entire system be connected so that the audio signal arriving at the speakers has correct, or "absolute" polarity (i.e., non-inverted). Connect the black or "-" speaker terminal to the wire that connects to the "0" terminal on the VSi60. Connect the red or "+" speaker terminal to the wire that connects to the "4" or "8" terminal on the VSi60, and tighten the speaker terminals securely to ensure best sonic results.

MATCHING: It is important to use as close as possible an impedance match between the amplifier and speaker for optimum transfer of power to the speaker with minimum distortion. In the case of speaker systems with significant variations in impedance throughout the frequency spectrum, such as most electrostatic types, determine the best impedance match empirically for best overall sonic results.

Connect the VSi60 input to the source components using only the highest grade of audio interconnect cables. To avoid sonic degradation use the shortest practical length of cables.

AC POWER CONNECTIONS: It is essential that the VSi60 amplifier be connected to a wall AC power receptacle, or a similar heavy-duty source. If it is connected to convenience receptacles on preamplifiers, etc., the full sonic capabilities of both the VSi60 and the preamplifier will be compromised.

For the very best sonic performance, the VSi60 should be connected to its own AC power circuit branch, protected by a 15 or 20 amp breaker. The other audio equipment should be connected to a different power circuit and breaker. Avoid the use of extension cords. If they must be used on a temporary basis, use 14-gauge or heavier cords.

The VSi60 utilizes a compatible grounding system that generally does not require a "ground lifter" adapter plug on the AC power cord to minimize hum. The 14-gauge power cord supplied with the VSi60 has a standard three-prong grounding plug to provide maximum safety when it is connected to a grounded wall receptacle. If there is any question regarding the safety of grounding procedures, be certain to seek competent help with the installation.

If electronic crossovers or other AC powered equipment are used with the VSi60 it may be necessary to use "ground lifter" adapters on the power plugs of that equipment to minimize system hum. Generally, the lowest hum is achieved when the only direct connection between audio common "ground" and true earth ground occurs in the preamplifier, through its grounded power cord. Other equipment in the system should have some form of isolation to prevent ground loops and associated hum.

Operating Procedure

Start-up:

1. Make sure you have read and complied with the INSTALLATION AND CONNECTION instructions prior to attempting operation.
 2. Secure all rear-panel connections between VSi60, and input sources, subwoofer amplifier (if applicable) and loudspeakers.
 3. Make sure the VSi60 is properly connected to a grounded high-current power receptacle via the supplied 14-gauge, 3-prong grounded power cord (see AC POWER CONNECTIONS).
 4. Turn Power switch to "on". The Mute LED will flash for approximately 30 seconds while power supply stabilizes, indicating operation of automatic muting circuit. After this automatic muting period the LED will stay on, indicating that your VSi60 is in the "mute" position. Adjust the Volume control to the minimum level, as indicated by illumination of the first (left-most) Volume LED. When the "operate" position is manually selected the Mute LED will turn off, indicating the VSi60 is ready for operation.
- Note: If the mute indicator LED fails to flash, check the appropriate fuse for possible failure. An extra fuse for A.C. power is included with your VSi60.
5. Press Input selector for desired source; set remaining switch options to desired positions.
 6. Activate selected input source, then deactivate Mute switch and adjust Volume control as necessary.
 7. Your VSi60 should now operate satisfactorily. However, a full stabilization or warm-up time of approximately one hour is recommended for best sonic performance.

Shut-Down:

1. Set Mute switch to "Mute" position.
2. Adjust Volume control to minimum setting (left-most first volume LED lit).
3. Push VSi60 Power switch to "off" position.

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Muting Provisions

The VSi60 has several provisions to help protect against misuse of the exceptional dynamic range and wide bandwidth that it offers. It is not subject to damage itself, but some speakers are more limited in their ability to withstand signal extremes. These provisions, both manual and automatic, are designed not to interfere with the listening experience, while giving reasonable protection against warm-up surges and power line interruptions. However, for absolute protection of associated equipment some operator understanding and responsibility are required.

Initial "settling" time of all circuit parameters within the VSi60 requires approximately 5 to 10 minutes. The automatic muting circuitry timer is adjusted for about 30 seconds. (This is because recurrent interruption "settling" time is much less. You would not want to wait for 5 to 10 minutes each time such an interruption occurred.)

The Mute/Operate switch allows manual disabling of the VSi60 inputs during the switching of equipment. Use of this switch will minimize stress on your VSi60 and other components. It is also highly recommended that manual muting be employed during turn-off for maximum protection.

The automatic muting operates as follows:

1. The automatic muting always disables all inputs and overrides any manual settings. (The "Operate" position of the manual Mute switch is functional only when the unit is not in the automatic mute mode.)

Note: Power supply regulation of the VSi60 is effective down to 100VAC (120V units) without serious sonic degradation.

2. The automatic muting of the VSi60 is designed to be effective only against power line interruptions and power line failures. It will not mute against subsonic signal transmissions from your input source. ***Proper fusing of speakers is essential to protect against excessive audio signal levels.***

Servicing

Because of its careful design and exacting standards of manufacture, your VSi60 amplifier should normally require only minimal service to maintain its high level of performance.

CAUTION: The VSi60 integrated amplifier contains sufficient levels of voltage and current to be ***lethal***. Do not tamper with a component or part inside the unit. Even with the power turned off, a charge remains in the energy storage capacitors for some time. Refer any needed service to your authorized Audio Research dealer or other qualified technician.

The vacuum tubes in your VSi60 should not need to be changed for approximately 2000 hours of use. Replacement vacuum tubes should be of equivalent quality and are available through your authorized retailer or directly from Audio Research Customer Service. For best performance, the 6550 output tubes should be matched pairs.

Additional questions regarding the operation, maintenance or servicing of your amplifier may be referred to Audio Research Customer Service at (763)-577-9700.(CST)

Output Tube Bias Adjustment

As shipped from the factory, the output "bias" adjustments are set for a nominal 60mA per 6550 tube. Under these idle conditions the tubes are each dissipating approximately 25 watts of their 48 watt rating (42 watt plate, 6 watt screen). This point of operation provides "enriched" Class AB₁, and will satisfy the most critical listener.

For best results, operate and adjust the VSi60 at 120VAC. Adjustment must be made under zero-signal conditions after at least 15-20 minutes of uninterrupted stabilization time.

A digital voltmeter capable of accurate measurements with 0.1mVDC resolution is preferred for accurate adjustment (must have 3 1/2 digit display). Use the plastic alignment tool provided to make the adjustment. The measurement points are banana test jacks at the rear of the VSi60. Adjust the "bias" for an average voltage reading of 60mVDC (.060 Volt DC) between test jacks, four places.

Cleaning

To maintain the new appearance of this unit, occasionally wipe the front panel and top cover with a soft, damp (not wet) cloth to remove dust. A mild, non-alkaline soap solution or dilute isopropyl alcohol may be used to remove fingerprints or similar smudges. Cleaners containing abrasives should ***not*** be used as they will damage the anodized finish of the front panel. A small, soft paint brush is effective in removing dust from bevels, the recessed nameplate and other features of the front panel.

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Disposal and Recycling Guidelines

To dispose of this electronic product, do not place in landfill. In accordance with the European Union Waste Electrical and Electronic Equipment (WEEE) directive effective August 2005, this product may contain regulated materials which upon disposal require special reuse and recycling processing.

Limited Warranty

Audio Research Corporation products are covered by a 3-Year Limited Warranty, or a 90-Day Limited Warranty (vacuum tubes). This Limited Warranty initiates from the date of purchase, and is limited to the original purchaser, or in the case of demonstration equipment, limited to the balance of warranty remaining after original shipment to the retailer or importer.

In the United States, the specific terms, conditions and remedies for fulfillment of this Limited Warranty are listed on the warranty card accompanying the product in its shipping carton, or may be obtained from the authorized retailer or from the Audio Research Customer Service Department. Outside the United States, the authorized importing retailer or distributor has accepted the responsibility for warranty of Audio Research products sold by them. The specific terms and remedies for fulfillment of the Limited Warranty may vary from country to country. Warranty service should normally be obtained from the importing retailer or distributor from whom the product was purchased.

In the unlikely event that technical service beyond the ability of the importer is required, Audio Research will fulfill the terms and conditions of the Limited Warranty. Such product must be returned at the purchaser's expense to the Audio Research factory, along with a photocopy of the dated purchase receipt for the product, a written description of the problem(s) encountered, and any information necessary for return shipment. The cost of return shipment is the responsibility of the purchaser.

Specifications

POWER OUTPUT: 50 watts per channel continuous from 20Hz to 20kHz. 1 kHz total harmonic distortion typically 1.5% at 50 watts, .05% at 1 watt.

Approximate actual power available at "clipping" 52 watts (1kHz). (Note that actual power output is dependent upon both line voltage and "condition" i. e.: if power line has high distortion, maximum power will be affected adversely, although from a listening standpoint this is not very critical.)

POWER BANDWIDTH: (-3dB points) 12Hz to 70kHz.

FREQUENCY RESPONSE: (-3dB points at 1 watt) 1.0Hz to 80 kHz.

INPUT SENSITIVITY: 0.47V RMS Single-ended for rated output. (32.5dB gain into 8 ohms.)

INPUT IMPEDANCE: 50K ohms Single-ended.

INPUTS (5): CD, Tuner, Video, SE1, SE2 (Single Ended RCA connectors).

MAXIMUM INPUT: 3.5V RMS (any input).

OUTPUT POLARITY: Non-Inverting (any input).

PUSH BUTTONS: Volume up, Volume down. (70 steps, 20 LED indicators), Input, Mono, Mute, Power. All functions on IR remote control.

OUTPUT TAPS: 8 ohms, 4 ohms.

OUTPUT REGULATION: Approximately 2dB 8 ohm load to open circuit (Damping factor approximately 4).

MONO SUBWOOFER OUTPUT: 1V RMS at rated power.

OVERALL NEGATIVE FEEDBACK: 7dB.

SLEW RATE: 12 volts/microsecond.

RISE TIME: 4 microseconds.

HUM & NOISE: Less than 0.1mV RMS – 106dB below rated output (IHF weighted, Vol down).

POWER SUPPLIES: Electronically regulated Low and High voltage supplies for input stages. Automatic 30 sec. warm-up / brown-out mute.

POWER SUPPLY ENERGY STORAGE: Approximately 166 joules.

POWER REQUIREMENTS: 100-125VAC 60Hz (200-250VAC 50Hz) 300 watts at rated output, 500 watts maximum, 200 watts at "idle". 1.0 watt power off.

TUBES REQUIRED: 2 – Matched pair 6550 – Power Output; 2 – 6H30 driver.

DIMENSIONS : 14" (35.6 cm) W x 8" (20.3 cm) H x 16" (40.6 cm) D. Rear connectors extend .88" beyond chassis.

WEIGHT: 34.8 lbs. (15.8 kg) Net; 38.3 lbs. (17.4 kg) Shipping.

Specifications subject to change without notice.

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