

# VELOCITY<sup>®</sup> 250

G U I T A R   P O W E R   A M P L I F I E R

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U   S   E   R   '   S   M   A   N   U   A   L

**ROCKTRON**  
C O R P O R A T I O N

*May be covered by one or more of the following:*

U.S. Patents #4538297, 4647876, 4696044, 4745309, 4881047, 4893099, 5124657, 5263091, 5268527, 5319713, 5333201, 5402498 and 5493617.

Other patents pending. Foreign patents pending.

## **! WARNING !**

The Velocity® 250 is capable of producing extremely high sound pressure levels. The use of ear protection is essential in situations when prolonged exposure to such high sound pressure levels occurs. Failure to use caution and/or ear protection when using this amplifier may result in permanent hearing impairment or hearing loss. United States Government guidelines concerning safe noise exposure levels should be referred to before operating the amplifier at high levels. The manufacturer is not responsible for any damage resulting from the use of this product.

### **UNPACKING**

Upon unpacking the Velocity® 250, save the carton and all the packing materials in case it becomes necessary to ship the unit.

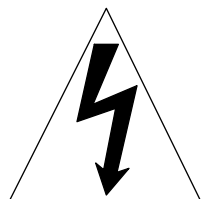
Be sure to thoroughly inspect your unit and its carton for any signs of damage that may have occurred during shipment. If there are any signs of damage, contact your dealer immediately.

### **INSTALLATION**

When installing the Velocity® 250 in your rack, it is best for ventilation and heat dissipation that the unit occupy the bottom space of your rack. It is also recommended that a vacant space is left above the power amp, if possible, to further improve ventilation.

### **OPERATING TEMPERATURE**

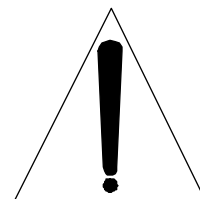
Do not expose this unit to excessively warm or cold temperatures. This unit is designed to operate between 32°F and 104°F (0°C and 40°C). This unit may not function properly under extreme conditions.



The lightning flash with arrowhead symbol, appearing on the rear panel of the unit, is intended to alert the user of this product of the presence of uninsulated, dangerous voltage which may be of sufficient magnitude to constitute a risk of electric shock.

### **CAUTION**

**RISK OF ELECTRIC SHOCK  
DO NOT OPEN**



The exclamation point symbol, which appears on the rear panel of the unit, is intended to alert the user of this product to the presence of important operating and maintenance instructions in the accompanying literature.

**CAUTION:** TO REDUCE THE RISK OF ELECTRIC SHOCK,  
DO NOT REMOVE COVER (OR BACK)  
NO USER-SERVICABLE PARTS INSIDE  
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

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Your Velocity 250 has been tested and complies with the following Standards and Directives as set forth by the European Union:

Council Directive(s): 89/336/EEC      Electromagnetic Compatibility

Standard(s):      EN55013, EN50082-1

This means that this product has been designed to meet stringent guidelines on how much RF energy it can emit, and that it should be immune from other sources of interference when properly used. Improper use of this equipment could result in increased RF emissions, which may or may not interfere with other electronic products.

To insure against this possibility, always use good shielded cables for all audio input connections. This will help insure compliance with the Directive(s).

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# Introduction

Congratulations on your purchase of the Velocity® 250 guitar power amplifier! The Velocity 250 was designed to provide the greatest flexibility with the highest reliability, even under extreme operating conditions. This 2-rackspace amp will provide 125 watts/channel when used in stereo applications or 250 watts mono bridged into a 8 ohm load—without a cooling fan!

The Velocity 250 has a unique "Reactance" circuit that actually replicates the output impedance of tube amplifiers—so you can get the same great sound that a tube amplifier delivers in a reliable solid state design. And, because it is a variable control, you can customize your Velocity 250 to sound like any of your favorite tube amps. Best of all, this feature is available in the mono bridged mode too!

In addition, the Velocity 250 has "Definition" controls to give you that little bit of edge you need to bring your playing out in the mix. It also has automatic short circuit protection, which detects problems and shuts down the amplifier before any internal damage can be done. It also has massive heatsinks for cool, reliable performance.

## *Other Features:*

- 115/230 VAC voltage selector switch.
- An AC power detect circuit, which ensures that the amplifier outputs shut down first when AC is removed. This will guard against any thumps or pops that could otherwise occur, potentially damaging speakers when power is cut to the amplifier.
- Differential input buffers to eliminate ground loop hum coming from the power amp.
- Over-temperature protection
- Rock-solid design to provide reliable, trouble-free use.

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# Velocity<sup>®</sup> 250 Design

Designers have been working at creating solid state amplifiers which sound like tube amplifiers ever since the transistor hit the scene. We at Rocktron first produced the Velocity 150 & 300 amplifiers with that goal in mind. The Velocity 250 takes what those first models provided to a whole new level.

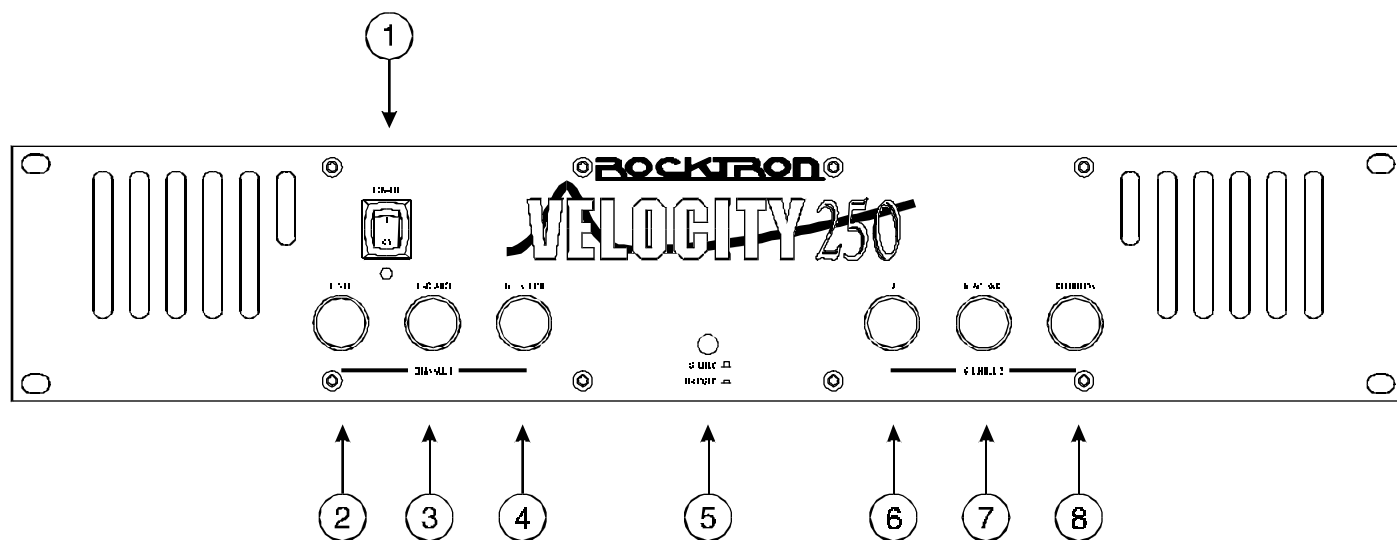
Every tube amplifier has some amount of output impedance due to the output stepdown transformer. Conversely, solid state amplifiers have little or no output impedance, because the speaker terminals are connected directly to the output devices. This difference in impedance is the primary reason why the two types of amplifiers sound differently. The reason the output impedance makes such a difference is because these amplifiers get connected to *speakers* (which also have their own impedance curves), not 4 or 8 ohm resistors. When a tube amplifier drives a speaker—each with its own characteristic impedance—they react to each other (i.e. one will effect what the other is doing). This is not the case with solid state amps—at least, not until now!

The engineers at Rocktron have developed a circuit which actually measures a speaker's impedance and changes the output response of an amp to match what you would hear from a tube amplifier—automatically! After developing this circuit, the only question that remained was "Which tube amp do we design to match to, since each one is different?". We came back and said "ALL of them!". By giving you a variable REACTANCE control, you control the amount of *effective*\* output impedance of the Velocity 250 to match any number of tube amplifiers. With the REACTANCE control at the minimum setting, a very low output impedance is simulated—similar to a good solid state amplifier. As the control is turned clockwise, the effective impedance increases and sounds more like a tube amplifier's output stage.

*\*Note: The word "effective" is used because if we actually increased the output impedance to, say 2 ohms for example, and had a 2 ohm speaker cabinet (for a total of 4 ohms), we would lose one half of the power before it even got to the speaker! That means our 125 watts/channel would only be good for 62 watts/channel. But with the Velocity 250, you still get the full rated output delivered to the speaker.*

What this means for you is that you get an amplifier that will react differently with each speaker cabinet you use with it, just like a tube amp would do. Plus, you get to control how much reactance you want to tailor fit the sound to your needs. The REACTANCE control in conjunction with the DEFINITION control gives you an incredible amount of flexibility that few amps on the market can touch. And, if you are really power hungry and want to mono bridge your amp, you won't sacrifice any of these features. Plus, with the massive heatsinking available on this amplifier, you won't have to worry about heat issues.

# Front Panel



## 1 POWER switch

*This switch powers up the Velocity 250.*

## 2 GAIN control

*This control determines the output level for Channel 1.*

## 3 REACTANCE control

*This control determines the amount of Reactance for Channel 1. As this control is turned clockwise, the simulated output impedance is increased and the Velocity 250 will increasingly exhibit the characteristics produced by the interaction between a tube amplifier and a guitar speaker cabinet. When turned fully counterclockwise, the simulated output impedance is at a minimum.*

## 4 DEFINITION control

*This control determines the level of definition for Channel 1. Turning this control fully counter-clockwise bypasses the Definition circuit, while turning it fully clockwise provides maximum Definition.*

## 5 STEREO/BRIDGED switch

*When switched to "BRIDGED" the Velocity 250 operates as a mono unit with increased output power (Channel 2 becomes inoperable in this condition). In the "STEREO" position the unit operates as a normal stereo amplifier.*

## 6 GAIN control

*This control determines the output level for Channel 2.*

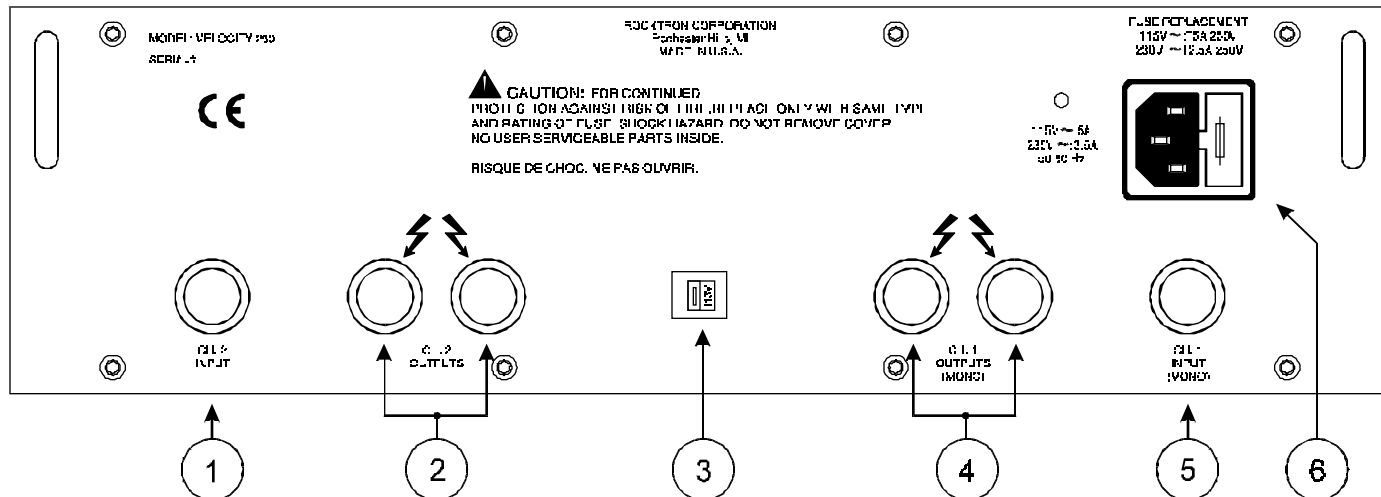
## 7 REACTANCE control

*This control determines the amount of Reactance for Channel 2. As this control is turned clockwise, the simulated output impedance is increased and the Velocity 250 will increasingly exhibit the characteristics produced by the interaction between a tube amplifier and a guitar speaker cabinet. When turned fully counterclockwise, the simulated output impedance is at a minimum.*

## 8 DEFINITION control

*This control determines the level of definition for Channel 2. Turning this control fully counter-clockwise bypasses the Definition circuit, while turning it fully clockwise provides maximum Definition.*

# Rear Panel



## 1 INPUT jack (Ch. 2)

*This standard ¼" jack provides an input to Channel 2 from the output of your preamp or the last device in your effects chain.*

*This jack is inoperable when using the Velocity 250 in "bridged" mode (i.e STEREO/BRIDGED switched to "BRIDGED").*

## 2 OUTPUT jacks (Ch. 2)

*These standard ¼" jacks provide outputs for Channel 2 to speaker cabinets. Do not connect these outputs to a load of less than 4 ohms (or less than 8 ohms in mono-bridged mode). These jacks are inoperable when using the Velocity 250 in "bridged" mode (i.e STEREO/BRIDGED switched to "BRIDGED").*

## 3 115/230 selector switch

*This switch allows for easy setup between 115VAC and 230VAC.*



**Warning: Improper setting of this switch may cause the unit to fail. Make sure the switch setting matches the local AC mains voltage.**

## 4 OUTPUT jacks (Ch. 1)

*These standard ¼" jacks provide outputs for Channel 1 to speaker cabinets. Do not connect these outputs to a load of less than 4 ohms (or less than 8 ohms in mono-bridged mode). These jacks are used when using the Velocity 250 in "bridged" mode.*

## 5 INPUT jack (Ch. 1)

*This standard ¼" jack provides an input to Channel 1 from the output of your preamp or the last device in your effects chain.*

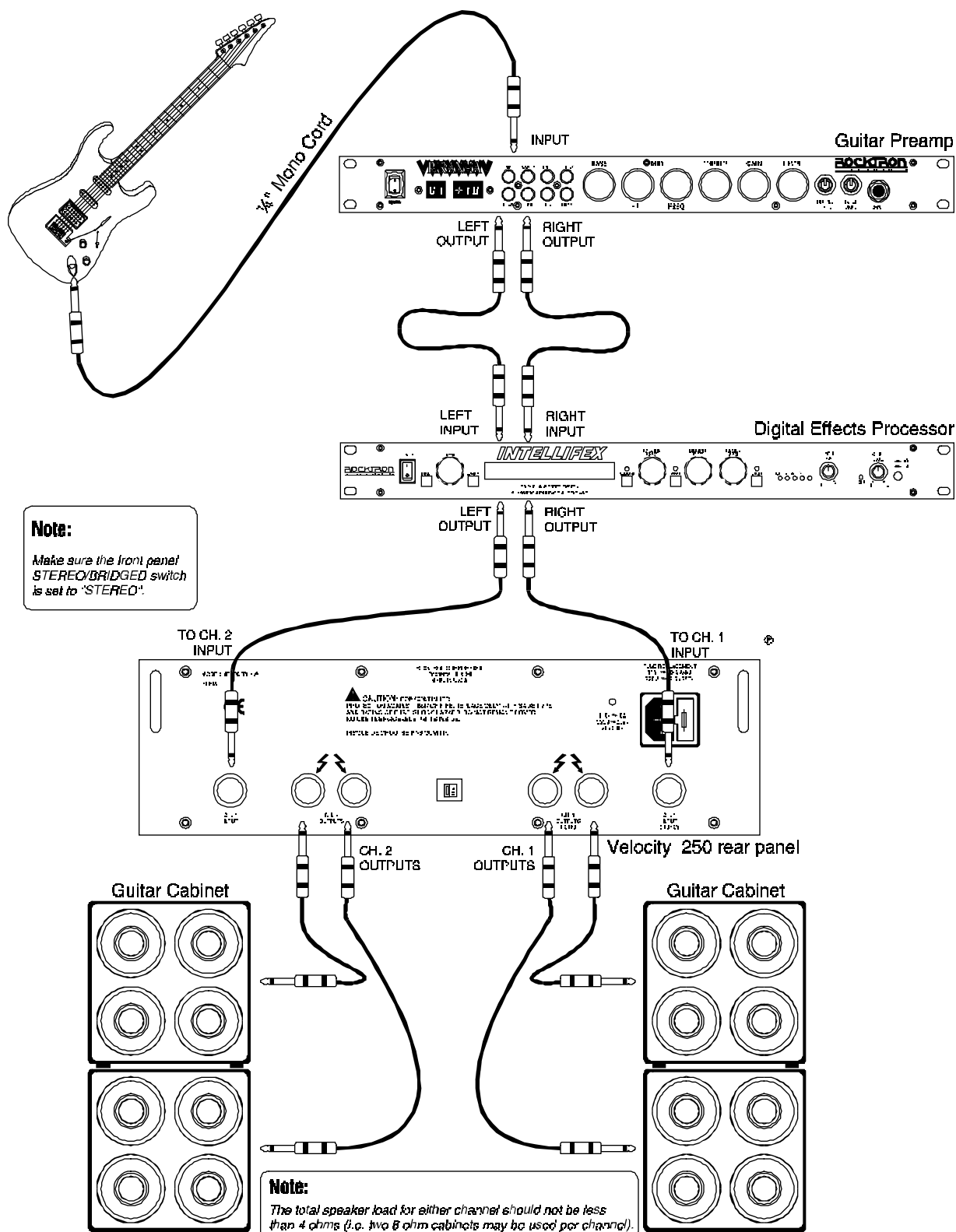
*This jack is used as the input jack when operating the Velocity 250 in "bridged" mode.*

## 6 POWER INLET module

*This module provides a connection for the power cord and also houses the main fuse of the unit. (For information about changing the fuse, see page 8).*

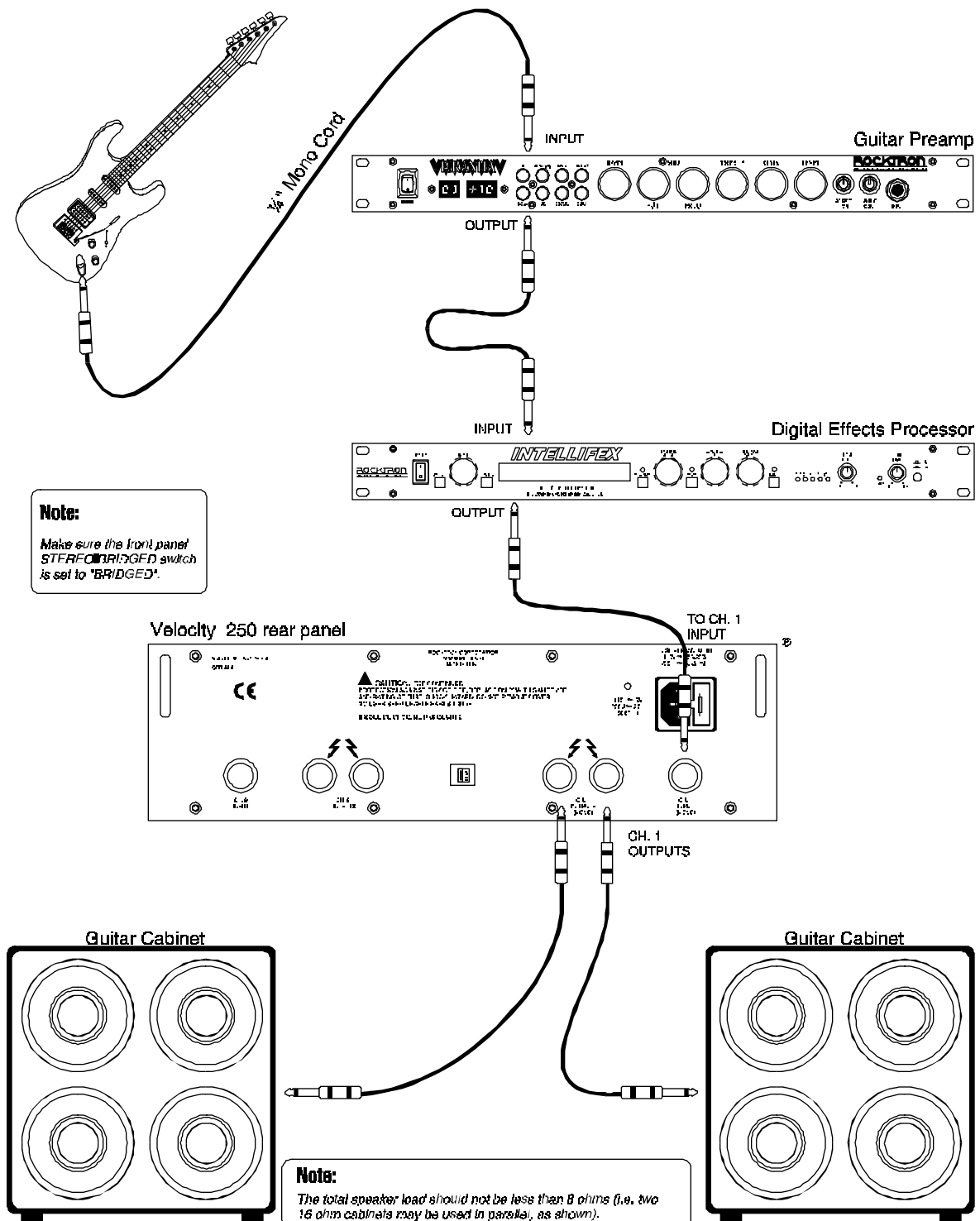
# Connections

## Stereo Applications





## Mono Bridged Applications



# Operating Precautions

Although operation of the Velocity 250 is simple once the proper connections have been made, attention to the following precautions is essential to protect your equipment against failure and ensure the long life of your Velocity® amplifier.

## **Power Output/Speaker Load**

The Velocity 250 is capable of producing the following power output levels into each of these loads:

### **Unbridged (Stereo)**

*(with both channels driven)*

4Ω load	125 watts
8Ω load	90 watts
16Ω load	50 watts

### **Bridged (Mono)**

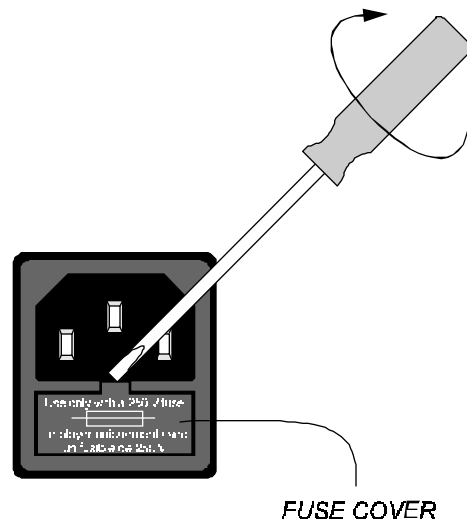
4Ω load	Not Recommended*
8Ω load	250 watts
16Ω load	170 watts

*\* **Note:** Rocktron does not recommend using the Velocity 250 in bridged mode when connected to a load of less than 8 ohms. However, using the Velocity 250 in bridged mode with an 8 ohm load produces a higher output level (250 watts) than would be achieved with a 4 ohm load - therefore using a 4 ohm load would provide no additional benefits.*

- ! Always be certain to use speakers or speaker cabinets capable of withstanding the power provided in the above mentioned applications. Rocktron is not responsible for speaker failure resulting from use of this equipment.
- ! **Never** connect 2 outputs of the amplifier to the same speaker. This would be equivalent to shorting the outputs of the amplifier together and would shut the unit down immediately.
- ! Plug and unplug speaker outputs with the power amplifier OFF to avoid over-current shutdown of the unit. (See page 9 for information on Automatic Short Detection.)

## Fuse Replacement

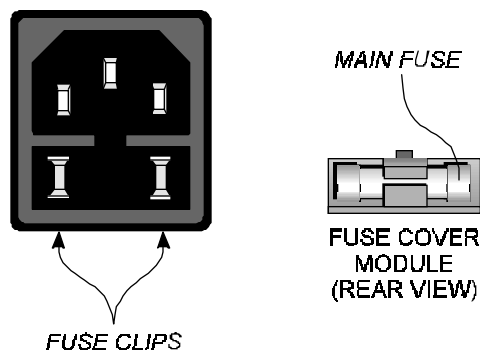
Always replace the main fuse with an identically rated replacement. Your Velocity 250 amplifier uses a 5x20mm, 5A amp, 250V slow-blow fuse (2.5A, 250V slow-blow for 230VAC). The fuse is located immediately below the line cord inlet on the rear panel and can be accessed by removing the fuse cover module as shown below.



*Use a small flat screwdriver as shown to slide the fuse cover out from the power inlet module. The fuse can be found inside the fuse cover module after it is pulled out.*



*Note: A small compartment is also provided within the fuse cover module for storing a spare fuse.*



*After replacing the fuse with another of identical specifications, push the fuse cover module fully back into place, ensuring that the fuse has snapped onto the fuse holder inside the power inlet module.*

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# Other Features

## ***Automatic Short Detection***

A feature truly unique to the Velocity line of power amps is Automatic Short Detection circuitry. Typically, shorting the outputs of a high output power amplifier will cause amplifier failure and severely damage internal components. The Automatic Short Detection circuit in the Velocity 250 will automatically detect any shorts which may inadvertently occur across the amplifier's outputs and immediately shut down the unit to protect it against internal damage.

Should this condition occur, switch the unit off for approximately 10 seconds and make sure that the cords from the amplifier outputs are properly connected. When the power is turned on again with the proper connections, the amplifier will operate normally. It is important to note that two outputs from the amplifier should never be connected to the same speaker, as this would be equivalent to shorting the outputs together and will cause the unit to shut down.

In the unlikely event that the proper connections have been made and the unit still shuts down, we strongly recommend that you first contact our Customer Support Department at the phone or fax number shown on the back cover of this manual before taking the unit to a dealer or repair shop for servicing.

## ***Definition Control***

When playing with other musicians, it often becomes a problem that the guitar can get "buried" under the other instruments and cannot be distinguished easily. The front panel Definition control gives the effect of bringing the guitar out of the cabinet so that it can be heard despite the other instruments. Although it does not actually effect the volume of the amplifier, the Definition control can be adjusted so that the guitar becomes more audible when playing with a band.

Turning the Definition control fully counterclockwise bypasses the definition circuit, while turning it fully clockwise provides maximum definition.

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# Specifications

<b>Output Power (Unbridged)</b>	<b>125 watts per channel @ 4Ω (both channels driven) 90 watts per channel @ 8Ω (both channels driven) 50 watts per channel @ 16Ω (both channels driven)</b>
<b>(Bridged)</b>	<b>250 watts @ 8Ω 170 watts @ 16Ω</b>
<b>Input Sensitivity</b>	<b>-7.3dBu (0.335V RMS), 4Ω stereo for rated output at max. gain</b>
<b>Maximum Input Level</b>	<b>23dBu (10.95V RMS), input stage clip point</b>
<b>Maximum Output Level</b>	<b>35dBu (4Ω bridged)</b>
<b>Maximum Gain</b>	<b>36dB</b>
<b>Noise Floor</b>	<b>-75dBu typical (referenced to 1 watt)</b>
<b>Dynamic Range</b>	<b>95dB</b>
<b>Distortion (Typical)</b>	<b>0.1% THD</b>
<b>Frequency Response</b>	<b>20Hz - 20KHz, +0/-3dB</b>
<b>Current Consumption</b>	<b>5 amps @115VAC max. (575 watts)</b>



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