

Pro VLA II™

PROFESSIONAL TWO CHANNEL VACTROL®/TUBE LEVELING AMPLIFIER

USER'S GUIDE



IMPORTANT SAFETY INSTRUCTIONS – READ FIRST



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure. Voltage that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read manual.

Read instructions:

Retain these safety and operating instructions for future reference. Heed all warnings printed here and on the equipment. Follow the operating instructions printed in this user guide.

Do not open:

Aside from two vacuum tubes, there are no user serviceable parts inside. Refer any service work to qualified technical personnel only.

Power sources:

Only connect the unit to mains power of the type marked on the rear panel. The power source must provide a good ground connection.

Power cord:

Use the power cord with sealed mains plug appropriate for your local mains supply as provided with the equipment. If the provided plug does not fit into your outlet consult your service agent. Route the power cord so that it is not likely to be walked on, stretched or pinched by items placed upon or against.

Grounding:

Do not defeat the grounding and polarization means of the power cord plug. Do not remove or tamper with the ground connection on the power cord.

Ventilation:

Do not obstruct the ventilation slots or position the unit where the air required for ventilation is impeded. If the unit is to be operated in a rack, case or other furniture, ensure that it is constructed to allow adequate ventilation.

Moisture:

To reduce the risk of fire or electrical shock do not expose the unit to rain, moisture or use in damp or wet conditions. Do not place a container of liquid on it, which may spill into any openings.

Heat:

Do not locate the unit in a place close to excessive heat or direct sunlight, as this could be a fire hazard. Locate the unit away from any equipment, which produces heat such as: power supplies, power amplifiers and heaters.

Environment:

Protect from excessive dirt, dust, heat, and vibration when operating and storing. Avoid tobacco ash, drink spillage and smoke, especially that associated with smoke machines.

Handling:

To prevent damage to the controls and cosmetics avoid rough handling and excessive vibration. Protect the controls from damage during transit. Use adequate padding if you need to ship the unit. To avoid injury to yourself or damage to the equipment take care when lifting, moving or carrying the unit.

Servicing:

Switch off the equipment and unplug the power cord immediately if it is exposed to moisture, spilled liquid, objects fallen into opening, or the power cord or plug becomes damaged during a lightning storm or if smoke odor or noise is noted. Refer servicing to qualified technical personnel only.

Installation:

Install the unit in accordance with the instructions printed in the user guide.

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INTRODUCTION

Thank you for purchasing Applied Research and Technology's Pro VLA II™. Offering a superb level of sound quality, the Pro VLA II™ has a unique design that will enhance the sonic textures of your audio system for years to come. The Pro VLA II™ is one of the finest audio compressors available. Developed in partnership with studio and live-sound engineers, the Pro VLA II™ possesses a "sound" that is not available from any other compressor on the market - at any price! Unlike typical compressors which use solid state feed-forward circuitry to control level detection, the Pro VLA II™ is very musical. The nature of its operation is much like the way your eye adjusts to light. Just as your eye transparently adjusts to changes in light, the Pro VLA II™ adjusts to changes in signal level.

The Pro VLA II™ was designed and constructed with the absolute best components, assuring a lifetime of quiet, reliable performance.

The Pro VLA II™ offers:

- Two channel opto-isolator (Vactrol®)/tube-based leveling amplifier
- Stereo linking of channels
- Master Volume and Balance control in *Link Mode*
- Hand selected 12AT7 Tubes
- Vactrol® - Analog Optical Isolators (AOI)
- Non-VCA design = transparent, classic sound
- VU metering of input and output levels
- LED metering of output level with peak-hold function
- XLR balanced inputs and outputs
- 1/4" TRS active balanced inputs and outputs
- Variable Threshold & Ratio controls
- Variable Attack and Release controls
- Variable Output Level rotary controls
- 10 segment Gain Reduction LED array
- 10Hz to 100KHz Frequency Response (+/-0.5dB)
- >100dB Dynamic Range
- Low noise (-99dBm 'A' weighted EIN)
- Internal power supply
- 3 year parts and labor warranty

INSTALLATION

The ART Pro VLA II™ may be used in a wide variety of applications and environments. In a rack-mountable, all-steel enclosure, the unit is designed for continuous professional use. Mounting location is not critical, however for greater performance reliability we recommend that you not place the unit on top of power amps, or other sources of heat and/or strong magnetic fields. The tube circuitry needs about a minute to "warm up" and stabilize from a cold power up.

Unpacking

Your Pro VLA II™ was packed with care at the factory. The shipping carton was designed to protect it during initial shipment. Please retain this carton for use in transporting the Pro VLA II™ when it is not installed in a rack, or in the unlikely event that you need to return your Pro VLA II™ for servicing. The shipping carton should contain:

- The Pro VLA II™
- The owner's manual
- User Registration Card

AC Power Hookup

The Pro VLA II™ has an internal power supply designed to operate at 100 to 125VAC, 50 to 60Hz. Units manufactured for use outside of the United States of America have been modified to comply with the required electrical specifications. Under no circumstances should the power cable be altered. If the cable becomes cut or damaged, discontinue its use and have it replaced before operating the Pro VLA II™.

The power source must provide a good ground connection, and the ground pin on the mains plug should never be defeated.

Analog Audio Connections

Audio connections to and from the Pro VLA II™ are:

Balanced input: [XLR] Pin 2 = Hot (+), Pin 3 = Cold (-), Pin 1 = Ground
[1/4"] Tip = Hot (+), Ring = Cold (-), Sleeve = Ground

Balanced output: [XLR] Pin 2 = Hot (+), Pin 3 = Cold (-), Pin 1 = Ground
[1/4"] Tip = Hot (+), Ring = Cold (-), Sleeve = Ground

Unbalanced 1/4" cables may be used with no damage to the Pro VLA II™. We recommend using only high-quality cables equipped with the appropriate connectors.

FRONT PANEL CONTROLS and INDICATORS

Power

The POWER switch turns the power on and off to the unit. The Pro VLA II™ should be turned “on” with all monitor levels turned down to protect against any “thumping” caused by power up. Likewise, the Pro VLA II™ should be turned “off” after turning all monitor levels down.

When the POWER switch is turned on, the VU meters will light. LEDs will light if its associated switch is in the “in” position. Power on the Pro VLA II™ before any monitoring outputs or power amps are turned on.

Like all tube-based equipment, the Pro VLA II™ needs to warm up to operating temperature. The 12AT7 tubes will reach operating temperature within one to three minutes. During this warm-up period you may experience sound variations due to the bias of the tubes stabilizing. This is normal and the Pro VLA II™ will provide consistent results once the warm-up period is over.

If the Pro VLA II™ fails to power up when the POWER switch is turned on, check to see that its power cord is plugged into an active outlet. If the unit still fails to operate properly, turn it off and unplug it. Then consult your dealer or the ART Customer Service Department.

Input Threshold Control

The INPUT THRESHOLD control sets the point at which the Pro VLA II™ will act on a signal. Turning this control counter-clockwise lowers the threshold (adding more compression to a signal). Turning this control clockwise raises the threshold.

Proper setting of the INPUT THRESHOLD control is dependent on the input signal. The output of a guitar can be –20dB to –10dB, whereas the level from an insert on a mixing console can be –10dB to +15dB. The easiest way to set the INPUT THRESHOLD control is to start with the control fully clockwise. Slowly turn the control counter-clockwise (lowering the threshold) until the yellow (0) LED light on the Gain Reduction meter begins to light. Next adjust the control (either lower or higher) for the desired amount of compression. Use the Gain Reduction meter as a visual guide to the amount of compression applied.

Ratio Control

The RATIO Control selects the “amount” of compression applied to the input signal once that signal reaches or exceeds the threshold. This compression amount is expressed as a ratio of input to output. For example if a 4:1 compression ratio is chosen, for every 4dB over the threshold the input signal rises, the output level only rises by 1dB. In this case if the input signal increased 12dB over the threshold, the output level would only rise by 3dB.

In general, compression ratios of 10:1 and greater are considered “limiting”. The range of the RATIO control is (2:1) to (20:1). The Pro VLA II™ may be used as either a compressor or a limiter with all of the following:

- Multitrack recorder, DAT machine, hard disk recorder, or analog recorder.
- In a mixer’s channel insert points.
- Between a microphone preamp and signal processors.
- Between preamplified electronic musical instruments (synthesizers, guitars, bass, samplers, acoustic instruments with pickups) and other line-level equipment.

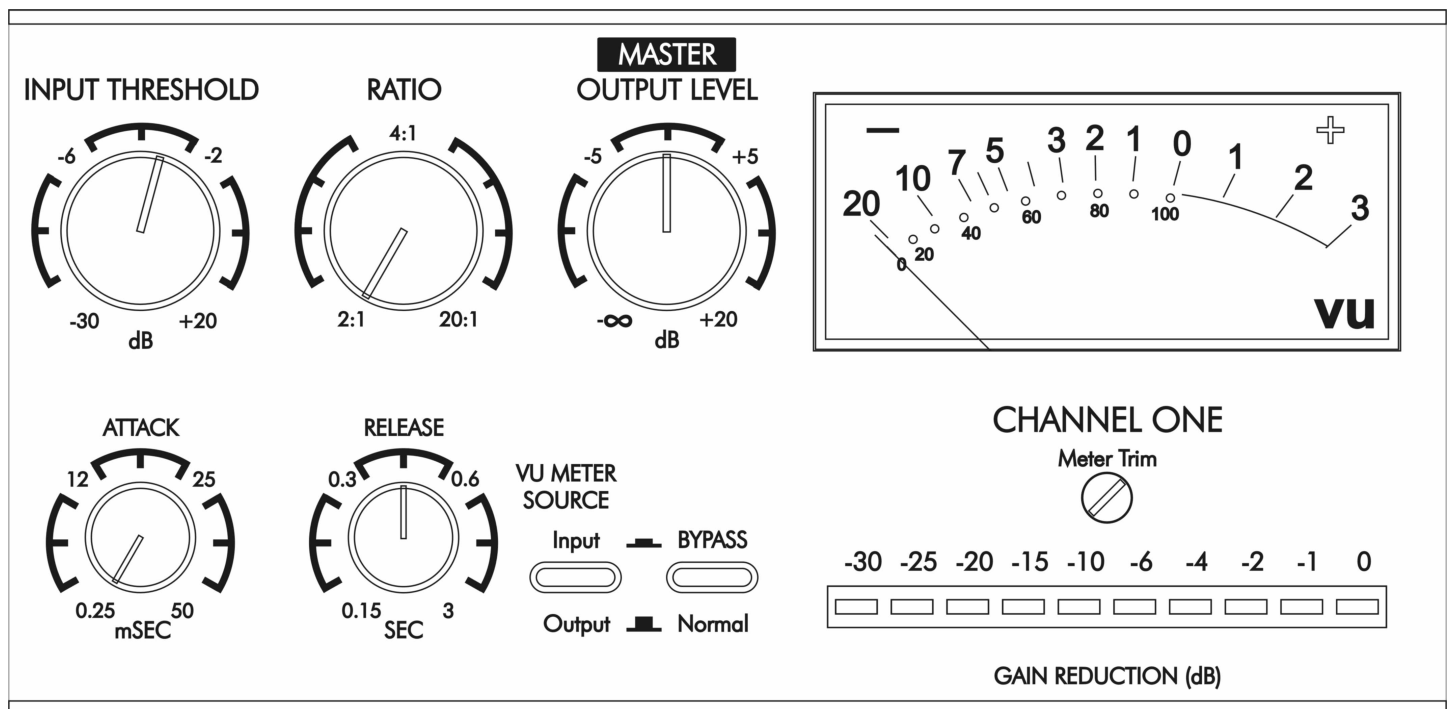


FIGURE 1 – Channel 1 Controls

Output Level Control

The OUTPUT LEVEL control serves two functions.

The CH1 knob always controls the output level of CH1, but can also serve as a “MASTER” output level when the *Link Mode* is active. The fully counter-clockwise position of the knob mutes the output.

The CH2 OUTPUT LEVEL control operates as a standard CH2 level control or as a “BALANCE” control when the *Link Mode* is active. In *Link Mode* when the BALANCE control is turned fully counter-clockwise the CH1 output is fully on and CH2 output is fully muted. When centered, both channels have equal gain. When turned fully clockwise the CH2 output is fully on and CH1 output is fully muted.

Attack Control

The ATTACK control sets the time it takes the Compressor/Limiter to respond to increases in signal level (by reducing gain). You can use this control to shape the “front end” of the dynamics envelope.

One example is to listen to a snare hit and adjust the ATTACK control. A short attack makes the snare sound “thin”. As the attack time goes longer (the knob is turned clockwise) you should hear more of the thump in the compressed snare. The downside is that this creates an overshoot, (or “transient”), the length of which is the time set by the ATTACK control.

Overshoots less than 1 msec. are very hard to hear even when they are clipped. If the ATTACK is set too fast, the gain may be reduced too much and thereby create a “pumping” sound¹.

¹ “Pumping” in a Compressor/Limiter sounds like the signal is muted when it shouldn’t be.

Release Control

The RELEASE control sets the time the Compressor/Limiter takes to increase the gain after the input level drops.

Longer settings maintain the dynamics of the input signal, while shorter settings reduce the dynamics. Shorter settings will also increase the apparent reverberation, and at extreme gain reduction settings, lead to “breathing” artifacts²

Gain Reduction LED Meter

The GAIN REDUCTION meter displays the Pro VLA II™ attenuation action. The meter covers a very large range while offering high resolution. The Yellow (0) LED illuminates when the input signal reaches or exceeds the compressor detector threshold setting (INPUT THRESHOLD control).

Bypass Switch

The Pro VLA II™ BYPASS switch physically connects the input jack to the output jack on each respective channel (also known as a hardwire bypass). The switch is lit when the unit is bypassed (unless power is off, yet the analog signal still passes from input to output).

VU Meter

The input or output levels of the Pro VLA II™ can be monitored by the analog VU meter. The VU METER switch selects the source of the audio for this meter. The ballistics characteristic of the meter provides an accurate indication of the average signal level. If you need peak level info (critical in digital systems) use the central stereo LED bargraph OUTPUT LEVEL meter.

VU Meter Source Switch

This switch selects either the input or output signal as a source for the analog VU meter, and lights when the input signal is selected. This function allows the user to compare the input vs. output level.

This switch does not affect the LED bargraph meter’s audio source.

² “Breathing” is the sound of the Compressor/Limiter turning up the gain so quickly you can hear breathing noises between words during vocal processing.

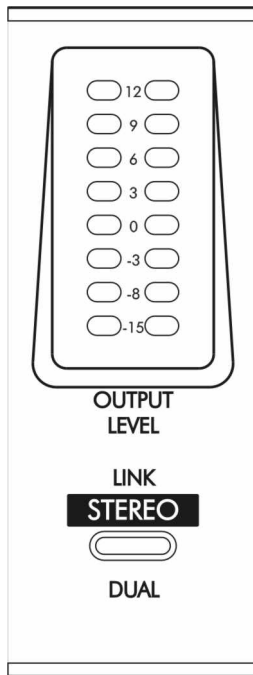


FIGURE 2 – LED Output Meter and Link Switch

LED Output Meter

This meter displays both average and peak levels of the output signal. The LED labels indicate how far the output is away from full maximum output in dB.

In each bargraph, a single LED is held on for a little over one second, displaying the peak level. Some peaks may not be audible, but can cause clipping in equipment following the Pro VLA II™.

Average levels are indicated by a histogram style display. The average levels displayed are similar to the VU meter when it is set to monitor the output level.

“0” on the meter corresponds to an output level of +16dBu when the I/O level switch is in the +4 mode. When in the “-10” mode, this level becomes +6dBu.

The Link Switch

The two channels of the Pro VLA II™ can be configured for stereo operation by depressing the LINK switch. *Link Mode* ties the output attenuation of both channels together onto the CH1 OUTPUT LEVEL knob, and moves all control over “Attack” and “Release” times to the CH1 set of controls. The CH2 OUTPUT LEVEL control becomes an output balance control. *Link Mode* ensures that each channel of the stereo input signal is processed identically to prevent any shifting or distortion of the stereo image.

Bypass and meter-source select switch functions remain unchanged in “link” mode.

REAR PANEL I/O

The Pro VLA II™ XLR connectors follow the AES standard of:
Pin 1 = Ground, Pin 2 = Hot (+), Pin 3 = Cold (-).

The balanced 1/4" phone jacks are typical TRS connections:
Tip - Hot (+), Ring - Cold (-), Sleeve - Ground.

Balanced Inputs

The Pro VLA II™ provides both an XLR and 1/4" input jack. Both jacks are balanced. The 1/4" jack can be used with unbalanced signals by simply plugging in an unbalanced cable.

The inputs are designed for use with line level signals ranging from -30dBm to +20dBm. While it is possible to plug an instrument directly into the Pro VLA II™, it is desirable to run the instrument into a preamp ahead of the Pro VLA II™. This will provide a stronger signal and will keep noise to a minimum. Microphones must connect through a microphone preamplifier (like the ART MPA GOLD) before connecting into the Pro VLA II™.

The input impedance of the input 10K Ohms.

NOTE: The Pro VLA II™ has a passive (hardwire) bypass. This means that the bypass works even if the power is OFF.

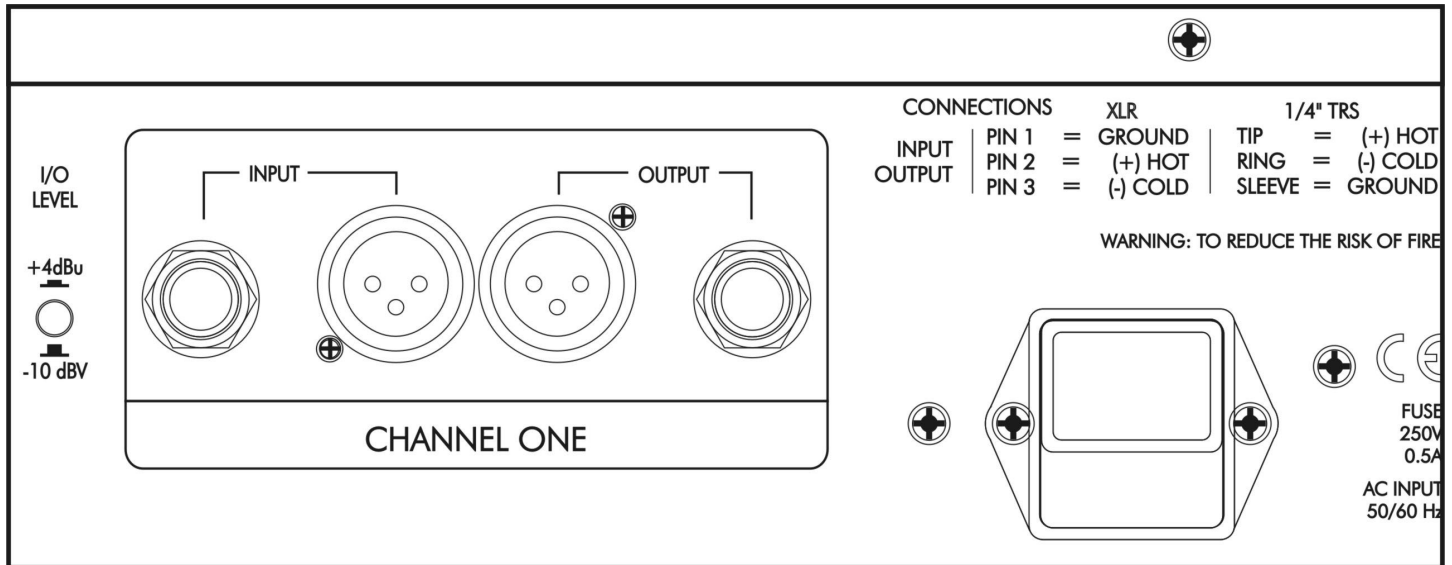


FIGURE 3 – Rear Panel

Balanced Outputs

The analog output of the Pro VLA II™ is available on both a 1/4" TRS balanced jack and an XLR jack. This output is active pseudo balanced. The output has a 100 Ohm impedance into a balanced or unbalanced load.

The LED and analog VU meter monitor the level present at this output. "0" VU on the analog VU meter corresponds to +4dBu (about 1.23 Volts RMS). "0" on the LED bargraph OUTPUT LEVEL meter corresponds to an output level of +16dBu into a balanced load.

I/O Level Switch

The Pro VLA II™ can be optimized for either "professional" (+4dBu) or "consumer" (-10dBV) I/O levels.

When the switch is depressed the unit is in "professional" levels mode. This shifts the levels such that "0" VU on the meter corresponds with +4dBu on the input or output.

When set to the "-10" mode, "0" VU corresponds to about -10dBV.

NOTE: +4dBu is equivalent to +4dBm into a 600 Ohm balanced load.

APPLICATIONS

Compressor/ Limiter

The main application of the Pro VLA II™ is to control the dynamic range of an audio signal. Plug a line level (post preamplifier or other gain stage) source into either input, and set the threshold and output controls to provide the desired amount of compression to the input signal.

Stereo Mix and Mastering

Because of its low noise and excellent tonal qualities, the Pro VLA II™ is ideal for processing mixes when recording to DAT, hard disk or analog recording devices. Used as a mastering device, the Pro VLA II™ is capable of adding warmth and impact to the overall signal level. Pro VLA II™ is ideal for live use as well.

Vocal and Instrument Leveling

The musical nature of the Pro VLA II™ makes it ideal for use on a wide range of instruments and vocals. Place the Pro VLA II™ into a channel insert, after a preamplifier, or in line with the direct output of a mixer channel. Adjust the controls of the Pro VLA II™ to achieve the desired amount of compression.

WARRANTY INFORMATION

Limited Warranty:

Applied Research and Technology will provide warranty and service for this unit in accordance with the following warrants:

Applied Research and Technology, (ART) warrants to the original purchaser that this product and the components thereof will be free from defects in workmanship and materials for a period of three years from the date of purchase. Applied Research and Technology will, without charge, repair or replace, at its option, defective product or component parts upon prepaid delivery to the factory service department or authorized service center, accompanied by proof of purchase date in the form of a valid sales receipt.

Exclusions:

This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. This warranty is void if the serial number is altered, defaced, or removed.

ART reserves the right to make changes in design or make additions to or improvements upon this product without any obligation to install the same on products previously manufactured.

ART shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific rights and you may have other rights, which vary from state to state.

For units purchased outside the United States, an authorized distributor of Applied Research and Technology will provide service.

SERVICE

The following information is provided in the unlikely event that your unit requires service.

- 1) Be sure that the unit is the cause of the problem. Check to make sure the unit has power, all cables are connected correctly, and the cables themselves are in working condition. You may want to consult with your dealer for assistance in troubleshooting or testing your particular configuration.
- 2) If you believe the ART unit is at fault, go to www.artproaudio.com. You may contact Customer Service for more assistance, or directly request a Return Authorization for service in the “resources” area of the website.
- 3) If you are returning the unit for service, pack the unit in its original carton or a reasonable substitute. The original packaging may not be suitable as a shipping carton, so consider putting the packaged unit in another box for shipping. Print the RA number clearly on the outside of the shipping box.
- 4) Include, with your unit, a note with the RA number and your contact information including a daytime phone number, preferably attached to the top of the unit.

SPECIFICATIONS

Input Impedance

Balanced/Unbalanced 10K Ohms

Maximum Levels

Range Switch +4dBu/-10dBV selectable
Inputs +20dBu (in +4dBu mode) / +10dBV (in -10dBV mode)
Output..... +20dBu (R load \geq 10K, 0.1%THD)

Output Gain +20dB max

Frequency Response 10Hz to 100KHz (+/- 0.5dB)

Dynamic Range >100dB (20-20KHz)

THD @ 0dBm Out: <0.1% (typical)

Equivalent Input Noise (EIN)

+4dBu mode -99dBu ('A' weighted)
-10 dBV mode -107dBu ('A' weighted)

Attack Time 0.25msec. to 50msec. variable

Release Time 150msec. to 3 sec, variable

Slope Variable: 2:1 to 20:1

Max. Attenuation 30dB

Dimensions 3.50" H x 19.0" W x 9.17" D

Weight..... 10.5 lbs.

Power Requirements USA – 105 to 125 VAC / 60 Hz Export units configured for country of destination.

Note: 0 dBu = 0.775 VRMS, 0 dBV = 1 VRMS

ART maintains a policy of constant product improvement. ART reserves the right to make changes in design, or make additions to, or improvements upon, this product without any obligation to install same on products previously manufactured. Therefore, specifications are subject to change without notice.

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