

# hq AUDIO by ANDREA CIUFFOLI-QUANG HAO.



**User Manual**

**HQ - REFERENCE DAC**

Version G

# Installation and Setup.

## Unpacking:

The content should include:

- HQ - REFERENCE DAC
- Remote Control
- This User Manual

Retain the packing for safe transport of your unit.

## Connecting to the Mains:

Check to make sure your DAC unit has been manufactured for operation at your AC line Voltage. Attempting to use the DAC at any voltage other than the specified on the rear of the unit may damage the unit. Damage caused by improper operation is not covered by warranty. If the voltage specified is different from your AC voltage, contact your dealer.

## Placement:

The unit is designed to run warm during normal operation but ensure you do block any ventilation openings.

Place the unit on a shelf or table. If you use an equipment Rack ensure the unit has adequate ventilation and is on its own shelf. Ensure your mains voltage corresponds to the rating plate on the rear of the unit.

## Connecting Directly to a Power Amplifier:

Avoid allowing static shocks to be applied to the inputs or outputs. To prevent static shocks, touch any grounded surface, such as the DACs chassis, before connecting or removing a cable. It is unlikely that a static shock will damage the unit, but it may cause circuitry to “lock-up”.

Inputs and outputs can be safely connected to the DAC unit before it is powered up

We strongly recommend that you use your DAC unit directly to your power amplifier. Even if you purchased your DAC unit with the intention of connecting it to your preamplifier, we suggest that you try direct connection to your amplifier. Many listeners are surprised by the improvement in performance over even the most expensive preamplifiers.

To connect your DAC unit to a power amplifier, ensure that your power amplifier is turned off then connect your analog interconnects from the DACs analog outputs to the amplifier's inputs.

## Using with a Preamplifier:

While the DAC unit was designed to be used without a preamplifier, no compromises were made in its design that will prevent excellent operation in a conventional system with a preamplifier.

When using a preamplifier, set the DAC units volume control to its maximum level.

# Description.

The HQ Reference DAC is a Stereo High fidelity DAC unit and includes advanced specification with high performance. There are several of customizable settings within the HQ Reference DAC to optimize sound quality for a wide range of setups. Please read this Manual before installing and operating the unit to take full advantage of all the features of this unit.

## Signal input:

- Coaxial S/PDIF
- Optical (TOSLINK)
- AES/EBU (balanced)
- USB 2.0

## Signal output:

- Unbalanced/balanced stereo analog output
- 32-bit Digital Volume Control

## Operating features:

- Automatic detect / decode of external digital input source.
- Multiple selectable digital filter settings with preset selection.
- Analog output level and input preset selection.
- Full featured aluminium IR remote control
- Discrete Class A output amplifiers to drive almost any headphone.

## Digital circuits:

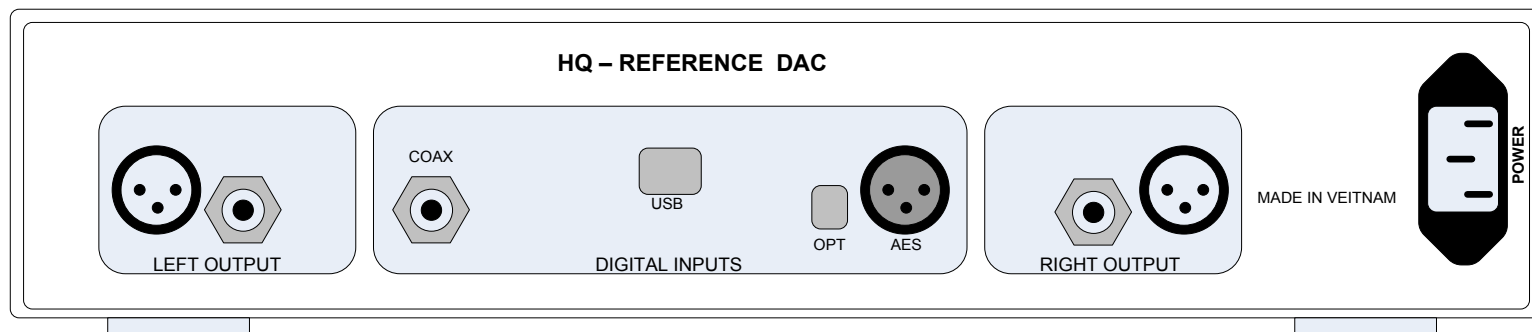
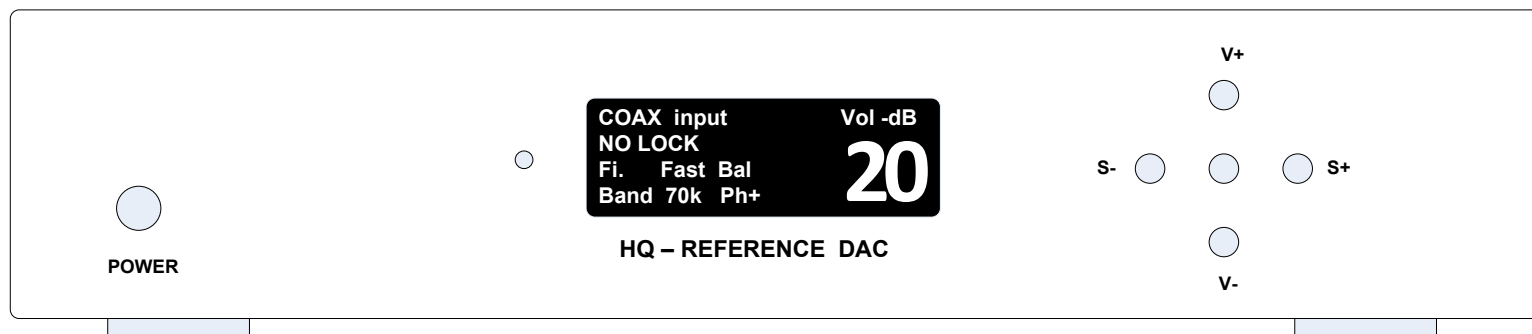
The DAC unit is based on the ES9018 Sabre32 reference DAC chip from ESS Technologies. It has a patented 32-bit hyperstream DAC architecture and Time Domain Jitter eliminator. The Dac chip has built in filters for both PCM and DSD and these filters can be adjusted by the user. The Dac board is supplied from 9 low noise regulators where 5pcs are discrete extreme low noise shunt regulators are used for the most critical circuits. The analog output is true balanced.

## Analog circuits:

The DAC unit can be delivered with two different Analog circuits.

The Analog circuits are designed as a real balanced discrete differential current amplifier with low distortion, no feedback and a class A output stage with the ability to drive any cable loads. The Analog circuit will also drive any low impedance headphone. The analog circuits are DC coupled and supplied by separate dedicated High current low noise discrete shunt regulators.

# Controls and Connectors



# Operational

## Switching On and Off:

Connect power to the unit and switch the mains on. Switch on the unit.

When switching off the unit: switch off the amplifier first.

When switching on the unit: The display shows the welcome screen.

After a short period the display menu shows.

## Selecting input:

Push **S+** or **S-** buttons on the front panel to select the wanted input.

When the input is selected and locked, the front panel displays input type, which can be either PCM or DSD. For PCM input the sampling frequency shows and for DSD input the sampling rate shows.

## Altering the Volume Level

The volume can be adjusted by using the front panel buttons **V+** or **V-**. The front panel displays the volume level.

## Mute:

To mute the analog output, push the **Mute** button. Push the **Mute** again for unmute the analog output. The Front panel will display the Mute status.

## Features:

The DAC unit features a Balanced/unbalanced function that shows on the display as Bal or Unbal. This refers to the output from the DAC chip(ES9018) not the Analog output of the DAC unit. The ES9018 has 8pcs analog outputs in total.

In the DAC unit these outputs are combined so there is 4pcs output for left side and 4 pcs output for right side (Stereo)

Unbal mode: The 4pcs output all in parallel and because the Solid state analog stage is True Balanced then there will NOT come any sound out of the analog modules.

You can use this mode if you uses the ES9018 output as single ended.

Bal mode: The 4pcs ES9018 output are now divided in to 2pcs in parallels and these are in phase 0 dgr and phase 180dgr.

When the display shows Bal then the solid state Analog module plays both via the RCA and the XLR output.

This feature will improve the analog output sound performance on the RCA connector only. Using the balanced output will the analog output signal will silence.

Change between Bal and Unbal mode.

On Remote: Push "SET"

On front panel: push S- and S+ at the same time to unbal or bal.

On Remote: push "DSP"--> "SET"

# Operational using the Remote Control.

## Custom default start up setting:

It is possible to change the default start up setting. E.g. if the optical input is often used, it can be a nice feature to have the DAC unit start up with the Optical input as default.

By pushing the **DSP** button in the "setting state" the unit will save the status for next switch-on.

Phase invert, Digital filter selections, volume level and input selection.

## Selecting input:

Push **CH+** or **CH-** buttons on the Remote Control to select the wanted input.

When the input is selected and locked, the front panel displays input type, which can be either PCM or DSD. For PCM input the sampling frequency shows and for DSD input the sampling rate shows.

## Volume Level:

The volume can be adjusted by using the Remote Control buttons **V+** or **V-**. The front panel displays the volume level.

## MUTE:

To mute the analog output, push the **Mute** button. Push the **Mute** again for unmute the analog output. The Front panel will display the Mute status.

## Digital filter selection:

The unit offers a wide choice of filters to enhance your listening experience. Two digital filter settings are possible, sharp roll-off and a slow roll-off for PCM mode. For DSD mode, there are 4 available filters with cut off at 47kHz, 50kHz, 60kHz and 70kHz.

For filter selection use the Remote Control.

Enter the programming mode by Pushing the **SET** button.

PCM filters: Select sharp roll-off or slow roll-off by pushing the buttons **V+** or **V-**

DSD filters: Select cut off at 47kHz, 50kHz, 60kHz or 70kHz by pushing the buttons **CH+** or **CH-**

Select the desired filter setting and Save the new setting by pushing the **DSP** button followed by the **SET** button

## DISPLAY Light:

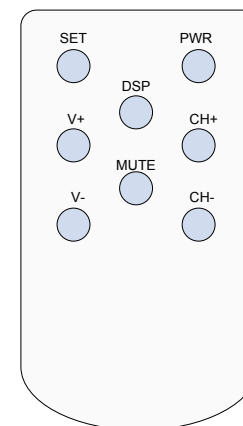
Push the **PWR** button on the Remote Control for switching On and Off the display backlight.

## Phase invert:

Note: Phase invert is only possible when using following inputs: AES, COAX, OPTICAL.

Change phase by pushing **SET** for stepping in to the setting state, push the **MUTE** button for Phase invert.

For saving the new setting: push the **DSP** button followed by **SET**.



# Drivers Setup

## Windows ASIO Driver Installation:

- The first step required in the Windows setup process is to install the ASIO driver:
- Don't connect the DAC unit to the PC until the driver is installed. Don't worry if you've connected the device already. Just disconnect it.
- Download the latest driver from <http://www.amanero.com/drivers.htm>
- Don't use setup packages downloaded from other websites.
- Unzip the installation package and double-click on Install.exe to start the installation. Follow the instructions. In most cases you just need to accept the defaults on the following screens.

## MAC/Linux ASIO Driver Installation:

- No Drivers for these operating systems is needed.
- See limitations in specification.

# Music player setup "1"

## **The Music player:**

To use hq Reference DAC with all the PCM sampling frequency and DSD sample rates, it is necessary configure the Music player (Foobar2000, Jriver or similar ) to use: Windows Audio Session API (WASAPI), Kernel streaming (KS) or Audio Streaming Input Output (ASIO ).

Using the default Windows driver called Direct Sound (DS) the DAC unit will work only at a specific frequency set in the Windows Audio control panel.

To work with the Kernel streaming (KS) and the Audio Streaming Input Output (ASIO ) it is necessary set as predefined a different sound device on Windows Audio control panel to keep the Amanero free for the application control.

The Kernel streaming (KS) is the lower level mode to operate on Audio device so there are lower stratification in the software stack.

The Windows Audio Session API (WASAPI) give less problems and it work very good with PCM and DSD tracks.

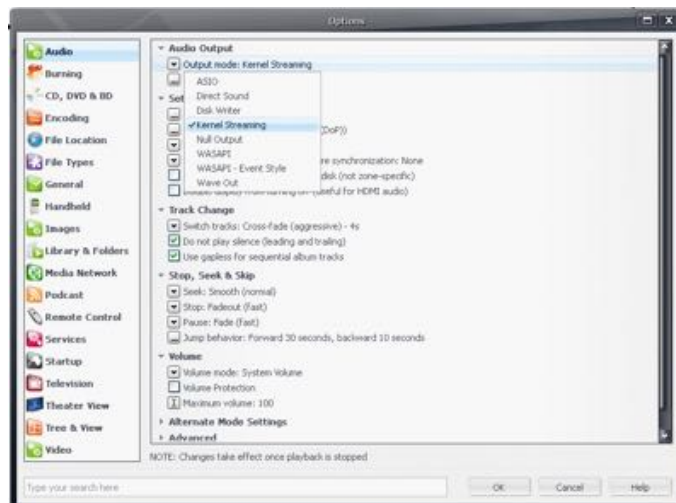
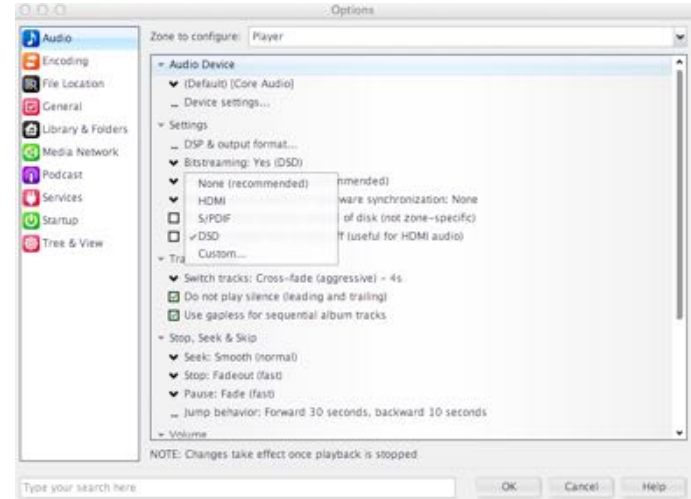
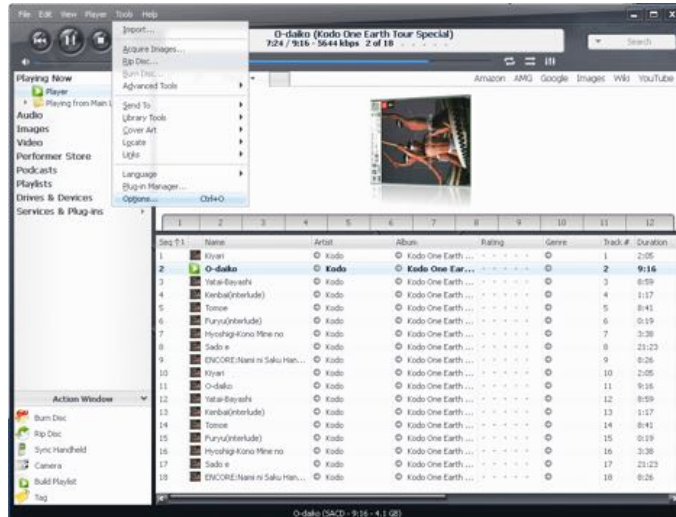
Set the Windows with no sound to avoid that the system messages interference during the reproduction.

Foobar2000 player is not easy to configure for playing DSD tracks but it is free, JRiver player is not free but very simple to use with PCM and DSD tracks.

Follow the images to configure JRiver media center 19 and make sure to use the latest version of the download.



# Music player setup "2"



(select Amanero KS, WASAPI or ASIO)

# Frequency Asked Questions.

## Balanced or Unbalanced connection?

If your amplifier has a true balanced input, we recommend to use the balanced analog output from your New DAC. All things being equal, properly implemented balanced (also called differential) circuitry sounds better than unbalanced circuitry. The DAC unit is a true balanced design. It generates the inverted signal in the digital domain and all subsequent processing is done in balanced mode. The DAC is designed to maintain many of the advantages of true balanced design when using the unbalanced outputs. In addition, the DAC analog output stage is capable of driving both types of outputs simultaneously.

## Bypass the Preamplifier?

A preamplifier is unnecessary when using your DAC unit. The DAC Unit provides all the necessary control functions of a preamp while the signal is still in the digital domain. This avoids the sonic degradation caused by analog circuitry, switches, and wire. The DAC units Analog output stage can drive any power amplifier and any interconnects, even at very long lengths.

## Leave the DAC unit with the power on?

The DAC unit is designed to be left with the power on with no harm or wear to the unit. If desired, the front display can be turned off (see Turning off the Display under Remote Operation). Leaving the power on allows the circuitry to remain in thermally stable, which provides better performance and longer life. Careful listeners will notice that the sound of the DAC unit will improve steadily after the unit is powered up. A new unit will undergo more dramatic changes when power is applied for the first time. If you turn off your DAC unit for more than an hour, you will find that the unit will undergo similar, but less dramatic improvement once power is reapplied.

## Bypassing the Volume Control?

Because the Digital Volume control does not include any analog circuitry, there is none to be bypassed. Even the mathematical program step that performs the Digital Volume Control calculation is an integral part of the HQ Reference DAC filter algorithm and therefore cannot be bypassed. If you do not need the Volume Control, set it to its maximum level of **-0dB** on the display. and save this level for the next switch-on using the remote command (SET + DSP).

## Does the Volume Control compromise resolution?

The unit uses the latest generation proprietary digital volume control. The volume level can be varied in the digital domain by means of mathematical manipulation of the signal, eliminating the distortion and noise that are inevitable with even the best analog volume controls. While conventional thinking indicates that reducing the volume digitally can sacrifice low level resolution, the DAC unit uses an innovative digital filtering algorithm produces a 32 bit output rather than the 16 bits stored on the CD. This high-resolution signal is then used in the computations which in turn reduce the volume level. This new signal is fed directly to the DAC inside the chip. Through this innovative method, the DAC unit maintains high resolution even at the lowest volume control settings.

# Adjustments:

## Adjustment of Maximum Output level:

The Maximum output level can be pre-set by the internal changing the internal jumpers on the analog boards.

First unplug the DAC unit from Mains before changing the jumper setting.

Unscrew the topcover using a Torx screwdriver.

Set the Jumpers J1 to J6 for the desired Maximum output level as described in the table below and the drawing of the analog modules to the right.

Remember to change the jumpers in both channels.

Output level	J1	J2	J3	J4	J5	J6
Unbal. output: 3.2Vrms Bal. output 6.4Vrms	Not used	Insert Jumper	—	Not used	Insert Jumper	—
Unbal. output: 2.8Vrms Bal. output 5.6Vrms	Not used	—	Insert Jumper	Not used	—	Insert Jumper

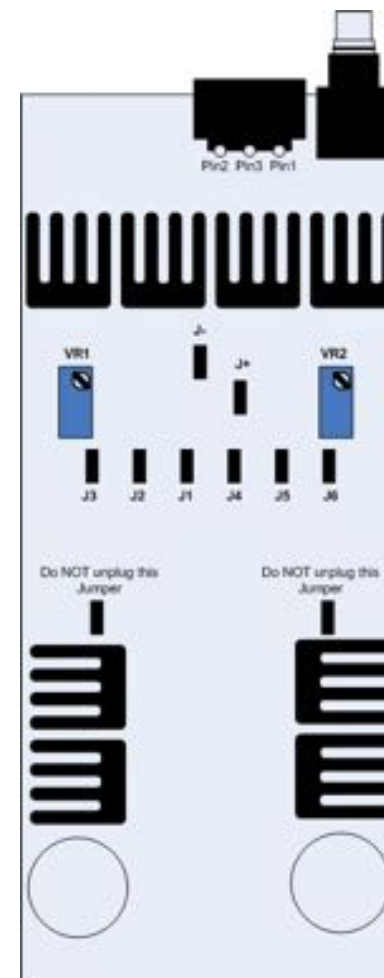
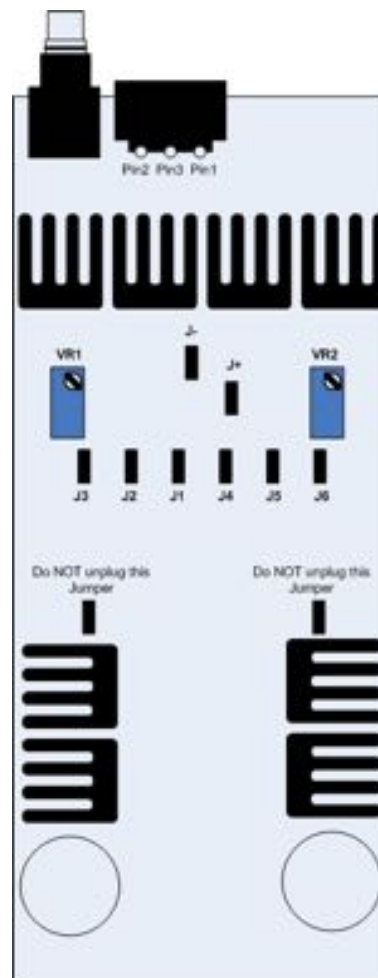
After changing the jumper setting in **both** channels, mount the topcover again and connect to the Mains. The DAC has now a new Maximum output level and make sure that the volume is below -50dB before turning on the Power amplifier/preamplifier.

## Adjustment of DC-offset on Line outputs:

DC offset on the Analog outputs can be minimized with following adjustmint.

- 1) Turn off the DAC unit
- 2) Unscrew the topcover
- 3) Connect a DC voltmeter between pin 1 and pin2 on the Balanced output connector.
- 4) Disconnect the 2pcs jumpers J+ and J-
- 5) Turn on the mains
- 6) "Mute" the Output
- 7) Adjust VR1 to offset <5mV
- 8) Connect a DC voltmeter between pin 1 and pin3 on the Balanced output connector.
- 9) Adjust VR2 to offset <5mV
- 10) Repeat the adjustment with the other channel
- 11) After Adjust, turn off the Mains
- 12) Connect the 2pcs jumpers J+ and J-
- 13) Mount the Topcover again
- 14) The DC offset has now been adjusted, Connect the Amplifier again and play music.

Please note: These adjustments only awalbe when the discrete analog module is installed. There are NO adjustments when using a Analog module with a Transformer output



# Specifications: Digital

PCM Sampling Rates	
Coaxial S/PDIF	44.1kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz up to 24bit
Optical (TOSLINK)	44.1kHz, 48 kHz, 88.2 kHz, 96 kHz up to 24bit
Asynchronous Bit Perfect USB	44.1kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz, 352.8 kHz, 384 kHz up to 32bit
DSD Sampling Rates	
Asynchronous USB	2.8224 MHz (64Fs) 3.072 MHz (64Fs)
	5.6448 MHz (128 Fs) 6.144 MHz (128 Fs)
	11.2896 MHz (256Fs) 12.288 MHz (256Fs) Windows only
	22.5792 MHz (512Fs) 24.576 MHz (512Fs) Windows only
DAC Master Clock Jitter (10Hz - 100kHz)	< 0,01pSec (10fSec) rms
Digital Volume Control Steps	1 dB
Digital Volume Matching between Channels	< 0.1 dB
Digital inputs	
1pcs. USB Connector	Classic USB B, USB 2.0
1pcs. S/PDIF	75 Ohm, Coaxial RCA
1pcs. S/PDIF	Optical Toslink
1pcs. AES/EBU (balanced)	110 Ohm, XLR
Number of channels USB	2 channels PCM, DSD
Number of channels SP/DIF	2 channels PCM
Operating System Requirements	
	MS OS XP to Win8 32-64bit: KS/Wasapi/WDM/ASIO Drivers
	MAC OSX 10.6 + (No drivers needed)
	Linux with UAC2 compliant kernel (No drivers needed) "eg Squeezebox Touch"

# Specifications: General.

Total Harmonic Distortion + Noise,1KHz, 0dBFS	
Balanced output	0.0045%
RCA output	0.035%
Signal-to-Noise Ratio	
A-weighted,	128 dB
Frequency Response	0 Hz - 20 KHz (<0.1dB)
Channel balance	<0.02dB
Channel Separation	>130 dB @ 1KHz
Phase	
AES/EBU, SP/DIF:	Non-inverting / Inverting
USB:	Non-inverting
Digital Filter	
PCM	Sharp / Slow Roll off
DSD	47kHz/50kHz/60kHz/70kHz
Line Output	
Unbalanced	RCA (gold-plated contacts)
Balanced	XLR (gold-plated contacts)
(XLR and RCA line outputs can be used simultaneously)	
Max Level Unbalanced	3.2 Vrms
Max Level Balanced	6.4 Vrms
Impedance	< 25 ohms
Offset	< 3 mV
<b>General Specifications:</b>	
Mains Input	115V AC / 230V AC 50Hz/60Hz
Power Consumption	< 35 W
Dimensions	
(W x H x D)mm	320x80x310
Weight	X.X lbs (X.XKg)

# Contact information

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