



User Manual



SONIC ULTRAMIZER SU9920

Ultimate Stereo Sound Enhancement Processor



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Thank you

Thank you for purchasing the SONIC ULTRAMIZER SU9920. The SU9920 is a professional signal processor used to improve the presence and liveliness of audio signals. For signal processing a combination of a dynamic filter and a phase delay algorithm is used. The latter is based on psychoacoustic principles and guarantees improved sound characteristics without unnatural side effects. The unit works with two independent channels, so you can selectively process stereo or two mono signals separately from each other. Whether you purchased the SU9920 for your studio, live sound or the stage, the unit's sound qualities are so impressive that you'll never again want to do without this sound enhancer when mixing.

We at BEHRINGER hope you enjoy your new acquisition.

EN Important Safety Instructions



Terminals marked with this symbol carry electrical current of sufficient magnitude to constitute risk of electric shock.

Use only high-quality professional speaker cables with ¼" TS or twist-locking plugs pre-installed. All other installation or modification should be performed only by qualified personnel.



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 the manual.



Caution

To reduce the risk of electric shock, do not remove the top cover (or the rear section). No user serviceable parts inside. Refer servicing to qualified personnel.



Caution

To reduce the risk of fire or electric shock, do not expose this appliance to rain and moisture. The apparatus shall not be exposed to dripping or splashing liquids and no objects filled with liquids, such as vases, shall be placed on the apparatus.



Caution

These service instructions are for use by qualified service personnel only. To reduce the risk of electric shock do not perform any servicing other than that contained in the operation instructions. Repairs have to be performed by qualified service personnel.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. 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.

10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11. Use only attachments/accessories specified by the manufacturer.



12. 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.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. 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.

15. The apparatus shall be connected to a MAINS socket outlet with a protective earthing connection.

16. Where the MAINS plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.



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LIMITED WARRANTY

For the applicable warranty terms and conditions and additional information regarding MUSIC Group's Limited Warranty, please see complete details online at www.music-group.com/warranty.

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1. Introduction

1.1 Before you get started

1.1.1 Shipment

Your product was carefully packed at the factory to ensure safe transport. Nevertheless, if the box is damaged inspect the unit immediately for signs of damage.

- ◆ If the unit is damaged please do NOT return it to us, but notify your dealer and the shipping company immediately; otherwise, claims for damage or replacement may not be granted.
- ◆ We recommend that you use a flight case to give the unit optimum protection during use or transport.
- ◆ Always use the original box to prevent damage during storage or transport.
- ◆ Make sure that children cannot play unsupervised with the unit or its packaging.
- ◆ Please ensure proper disposal of all packing materials.

1.1.2 Initial operation

Ensure adequate air supply and to avoid overheating do not place the unit near radiators etc.

- ◆ Blown fuses must be replaced by fuses of the correct rating! Please refer to the "SPECIFICATIONS" section for the applicable rating.

For connection to the mains use the enclosed power cord with cold connector which complies with the relevant safety regulations.

- ◆ Please make sure that all devices are properly grounded. For your own safety, never remove or disable the ground conductors from the devices or on the power cords. The unit must always be connected to the mains outlet with a protective grounding connection.
- ◆ The tone quality may diminish within the range of powerful radio broadcasting stations and high-frequency sources. Increase the distance between the transmitter and the unit, and use shielded cables for all connections.

1.1.3 Online Registration

Please register your new BEHRINGER equipment right after your purchase by visiting <http://behringer.com> and read the terms and conditions of our warranty carefully.

Should your BEHRINGER product malfunction, it is our intention to have it repaired as quickly as possible. To arrange for warranty service, please contact the BEHRINGER retailer from whom the equipment was purchased. Should your BEHRINGER dealer not be located in your vicinity, you may directly contact one of our subsidiaries. Corresponding contact information is included in the original equipment packaging (Global Contact Information/European Contact Information). Should your country not be listed, please contact the distributor nearest you. A list of distributors can be found in the support area of our website (<http://behringer.com>).

Registering your purchase and equipment with us helps us process your repair claims more quickly and efficiently.

Thank you for your cooperation!

2. Control Elements and Connections

2.1 Front panel

The control elements for CHANNEL 1 and CHANNEL 2 are identical. In the following paragraphs the functions are described using CHANNEL 1 as an example.

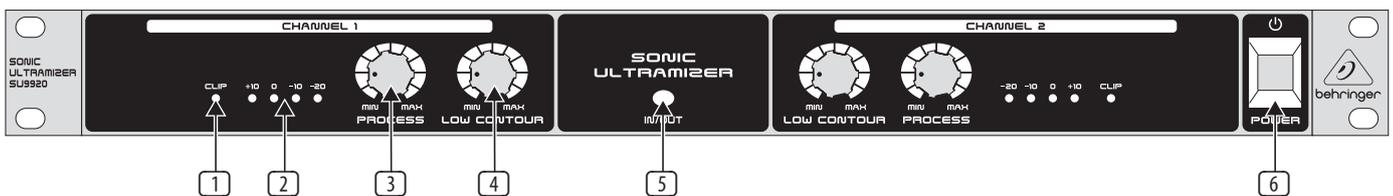


Fig. 2.1: Control elements on the front panel

- 1 **CLIP:** This LED is constantly lit when the input level is too high. If it lights up for a short period of time it is warning you of an impending overdrive. There is a safety headroom of 3 dBu before the signal becomes distorted. The LED should not light up.
 - 2 **LEDs:** The four LEDs display the output level in 10 dBu steps. Regular illumination of the 0 dBu LED indicates an optimal output level.
 - 3 **PROCESS:** With this control the portion of high-frequency signals to be processed by the SU9920 is specified. The MAX setting corresponds to a level boost of +12 dBu at 5 kHz.
 - 4 **LOW CONTOUR:** This control adjusts the portion of low-frequency signals to be processed by the SU9920. The MAX setting corresponds to a level boost of +12 dBu at 50 kHz.
 - 5 **IN/OUT:** With this switch signal processing is activated and deactivated. The LED lights up in the active operating mode.
 - 6 **POWER:** Use the POWER switch to put the unit into operation. The POWER switch should be in the "Off" position when you connect the unit to the power feed (mains).
- To disconnect the unit from the mains, pull out the power plug. When switching on the unit ensure that the power plug is easily accessible. To mount the unit in a rack ensure that the unit can easily be disconnected from the mains by means of a plug or an all-pole mains switch on the back side.
- ◆ Please note: Switching the POWER switch off does not disconnect the unit completely from the mains. For this reason you should unplug the power cord if the unit is not going to be used for prolonged periods of time.

2.2 Rear panel

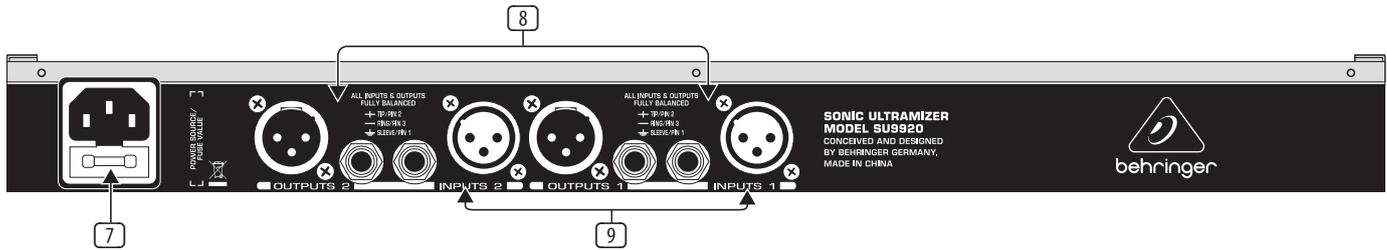


Fig. 2.2: Control elements on the rear panel

- 7 **FUSE HOLDER / IEC POWER SOCKET:** The mains connection is made via an IEC male socket. It complies with relevant safety regulations. A suitable power cord is included. Replace the fuse with a fuse of the same type.
- 8 **OUTPUTS 1:** Balanced XLR sockets and 1/4" jacks - these are used to connect amplifiers as well as further signal processors and recording devices. The jacks and XLR sockets can be used in parallel when two outputs are required.
- 9 **INPUTS 1:** Balanced XLR sockets and 1/4" jacks - these are used to connect line-level signal sources (e.g. a mixing console). To avoid interference only the jacks or the XLR sockets should be used.

SERIAL NUMBER: The serial number can be found on the back right side of the unit. It is needed for online registration.

3. Practical Application

The SU9920 belongs to the group of psychoacoustic enhancers which also includes exciters. These devices can enhance the quality of audio signals.

In contrast to an exciter, the SONIC ULTRAMIZER does not add any new harmonics to the signal, but rather improves the signal quality by processing the harmonics in the original material. Through this action the sound is changed more naturally than it is through harmonic enhancement with an exciter.

The concept behind the SONIC ULTRAMIZER is based on the fact that through signal modification (as is caused for example, by equalizers and frequency filters), the original signal is distorted. Through this the time-based sequence of the fundamental tone and the harmonics, whose correlation is extremely important for naturally sounding signal reproduction via loudspeakers, is shifted. Restoring the original time-based relationships between the fundamental tone and the harmonics thus ideally leads to optimal reproduction of the original signal and hence a sound which is free from unpleasant distortion.

With the SU9920 you can reproduce the original relationships between the fundamental tone and the harmonics and additionally boost the high and low-frequency portions independently of each other. Through this the transparency of the starting signal is greatly increased and a precise reproduction of all signals over the entire frequency spectrum is obtained.

3.1 Application examples

Similarly to a compressor or a graphic equalizer, the SU9920 is integrated into the signal path, i.e. connected in series to mix outputs or integrated into the insert path of a mixing console. Avoid parallel use in the Aux path, as with an effects unit, since this mixes the original signal with the processed effect signal, thereby considerably worsening the sound characteristics.

The best way to use the SONIC ULTRAMIZER is in a signal chain, e.g. from keyboard to SU9920 to amplifier, as the following application examples show.

3.1.1 Live sound

The SU9920 is ideally suited to use with live sound systems in clubs, discos, live concerts and public performances. Here the unit not only can considerably improve the signal quality, but also can compensate for the inadequacies of small or weak PA systems.

For this application the unit should be installed between the mixing console mix output and the amplifier input. If a graphic equalizer is also used, it should be positioned after the SU9920.

Because this application involves stereo processing, channels 1 and 2 must have the same settings. Otherwise, the original stereo image will be distorted.

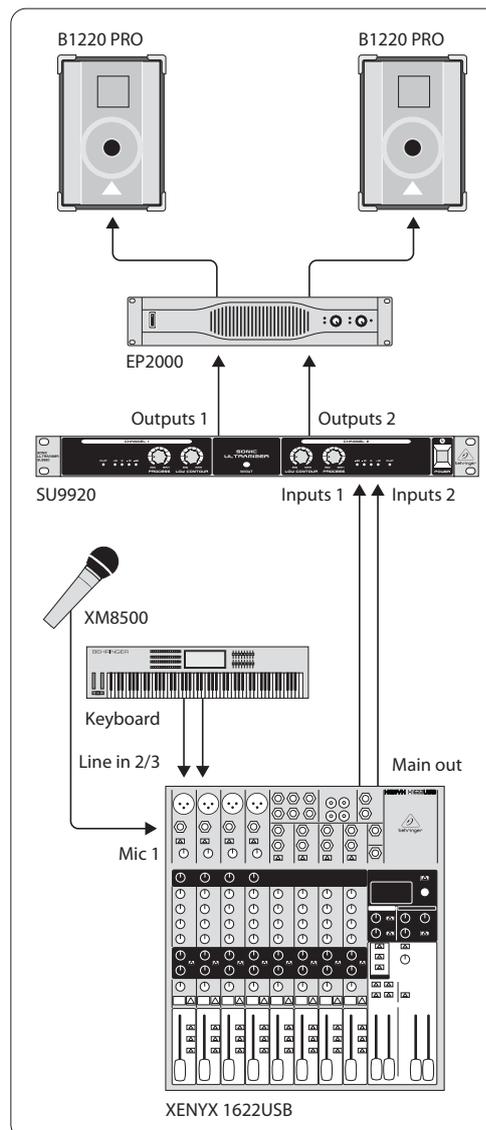


Fig. 3.1: Use of the SU9920 with live sound systems

3.1.2 Studio application

In a studio environment the SONIC ULTRAMIZER is ideal for mastering to enhance the sound of recordings. The SU9920 can lend your music the professional polish of high-quality productions in just a few steps. Even if you primarily work with a digital audio workstation, you can perform the final mastering with the SU9920 and an external recorder.

For this application connect the SU9920 so that it comes before the mastering recorder. Channels 1 and 2 must have the same settings since this application involves stereo processing. Otherwise, the original stereo image will be distorted.

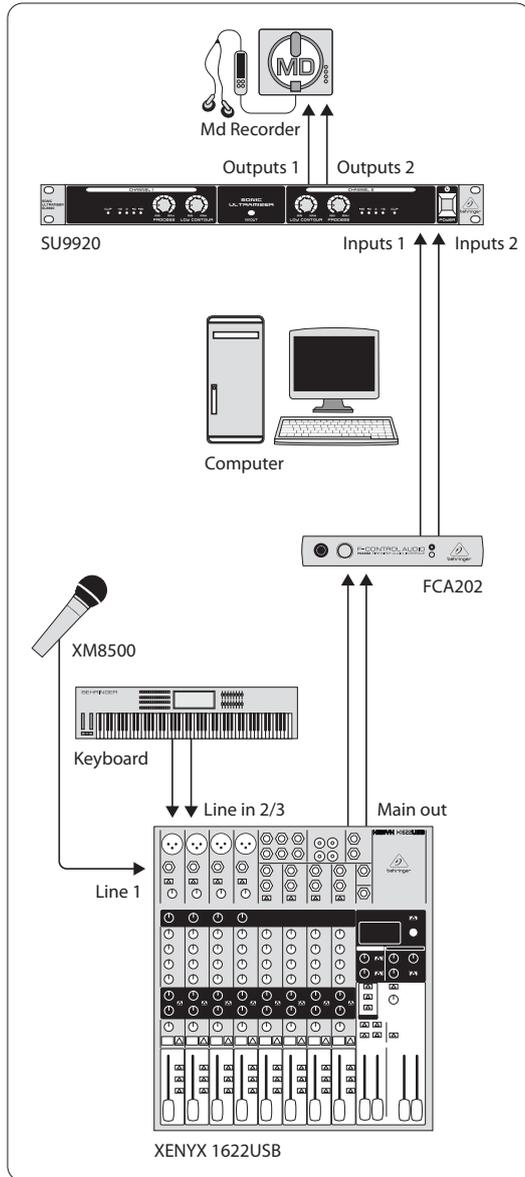


Fig. 3.2: The SU9920 in Studio mode

3.1.3 Stage operation with instrument amplifiers

Besides being ideal for use with stereo signals, the SONIC ULTRAMIZER is also suitable for use with one or two individual signals, e.g. guitars. With electric guitars it can be used in combination with a combo amp or a separate modelling processor-amplifier combination to give the guitar sound more presence, fullness and punch. A similar combination with a keyboard and an external amplifier is possible. Because the two channels of the SU9920 work independently, even two different mono signals can be processed.

Connect the SU9920 with the effects loop connections on your combo amplifier if it provides for connection in insert mode, i.e. exclusively reproduces the output signal of the SU9920 via the loudspeaker.

If you are using a modelling processor you must connect the processor output to the SU9920 input and route the SU9920 signal to the amplifier.

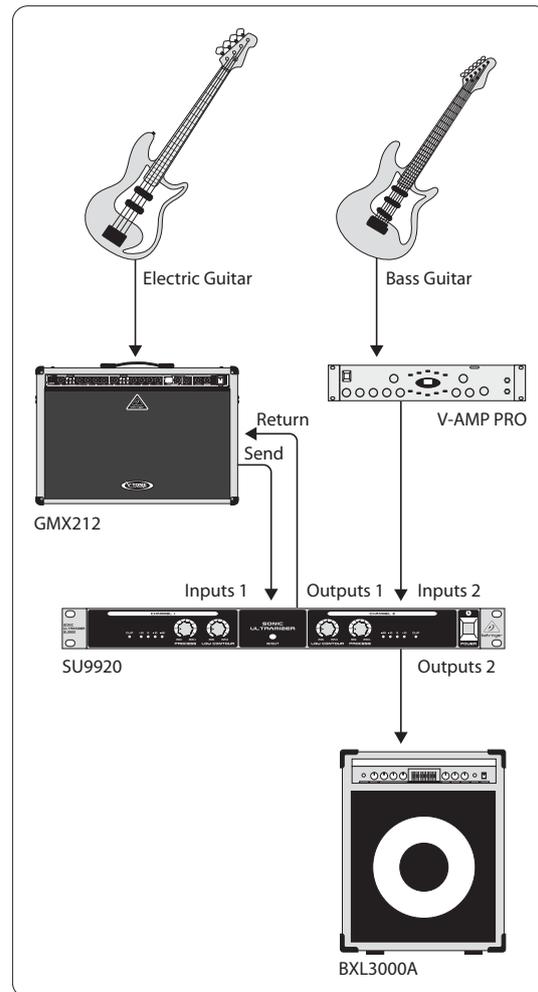


Fig. 3.3: The SU9920 in use with guitar amplifiers

3.2 Basic operation

Due to the small number of control elements on the SU9920 it is easy to learn to use it. Perform the following steps:

- 1) Connect the unit according to the application as described in section 3.1.
 - 2) Switch on all devices (amplifier and loudspeaker last) and ensure that the IN/OUT switch  on the SU9920 is illuminated, i.e. that the unit is working and all controls are set to 'MIN'.
- ♦ **First make the following settings for one channel (channel 1 or 2) according to the input assignment. For stereo applications choose the same settings for the second channel as those made for the first channel.**
- 3) Set the signal level on the device feeding the SONIC ULTRAMIZER such that the CLIP LED  on the SU9920 either does not light up at all or for a short period of time only.
 - 4) Turn the PROCESS control  until the desired enhancement effect in the high-frequency range is achieved or the 0 dBu LED in the level display  lights up continuously.
 - 5) Turn the LOW CONTOUR control  until the desired enhancement effect in the low-frequency range is achieved or the 0 dBu LED in the level display  lights up continuously.
 - 6) To compare the original and processed signals, repeatedly press the IN/OUT button.
 - 7) Repeat steps 4) to 6) until you are satisfied with the result.

4. Installation

4.1 Rack mounting

The BEHRINGER SONIC ULTRAMIZER SU9920 requires 1U for installation in a 19-inch rack. Please make sure that you leave around 10 cm for the rear connections. For installation of the unit in a rack please use M6 machine screws and nuts.

4.2 Audio connections

There are various ways to integrate the SU9920 into your setup. Depending on the application you will need different connecting cables, and these will be discussed in the following section.

4.2.1 Cabling with jack cables

To operate the SU9920 in series with other equipment, you will need standard commercial ¼" jack cables, often referred to as instrument cables or patch cables.

These cables have a ¼" TS jack plug at each end. Connect the inputs of the equipment with the corresponding outputs of each of the other devices.

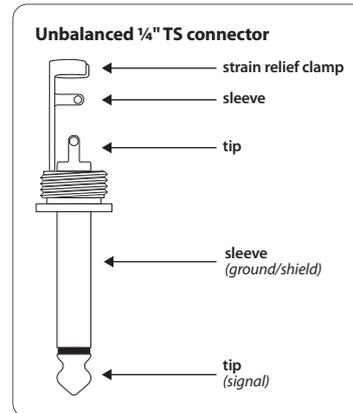


Fig. 4.1: Unbalanced ¼" TS jack plugs

If your other equipment has balanced inputs, use a balanced switched cable with two stereo jack plugs at the balanced outputs of the SU9920. These cables provide a high level of security against interference signals such as noise interference from power cables, and they should be used for all long cable routes.

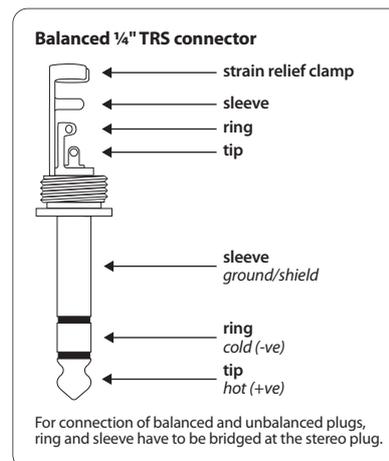


Fig. 4.2: Balanced ¼" TRS jack plugs

Alternatively, you can use professional XLR cables with an XLR socket on one side and an XLR plug on the other side. This cable connection is the most reliable both electrically and mechanically.

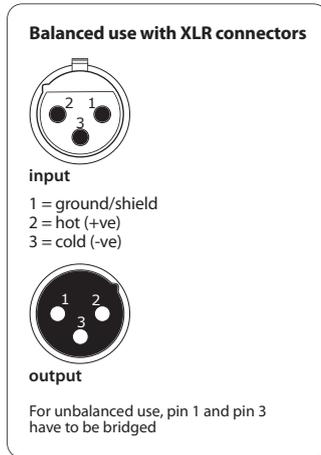


Fig. 4.3: Balanced XLR plug

4.2.2 Connection with insert cables

Please use standard insert cables equipped with ¼" connectors to connect the SONIC ULTRAMIZER to the insert path of a mixing console. These Y cables have two ¼" TS connectors at one end, and one ¼" TRS connector at the other. Connect the plug marked "Send" to the INPUT L jack on the effects unit. Connect the "Return" plug to the OUTPUT L jack on the device. Connect the TRS connector to the insert jack of the channel strip on the mixing console. Use two insert cables for stereo sub-groups and main-mix inserts. The second cable must be connected to the INPUT/OUTPUT R jacks of the SU9920.

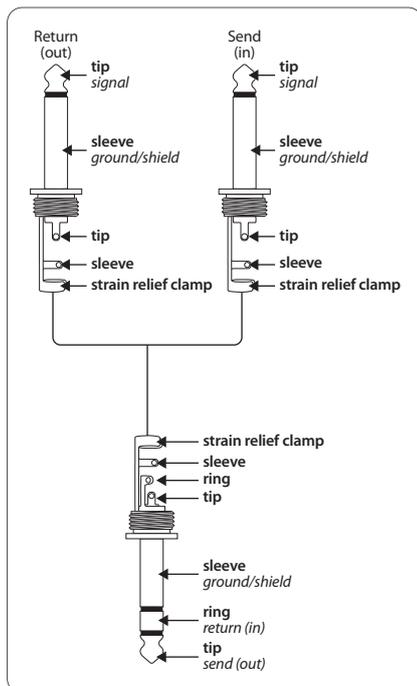


Fig. 4.4: Insert cable with one ¼" TRS (tip-ring-sleeve) jack plug on one end and two ¼" TS (tip-sleeve) jack plugs on the other end.

5. Specifications

Inputs

Connections	XLR sockets and ¼" stereo jacks
Type	Balanced
Input impedance	20 k Ω balanced, 10 k Ω unbalanced
Nominal input level	+4 dBu
Maximum input level	+22 dBu

Outputs

Connections	XLR sockets and ¼" stereo jacks
Type	Servo-balanced
Output impedance	60 Ω balanced, 60 Ω unbalanced
Maximum output level	+22 dBu

Enhancer Section

Type	3-band phase delay and dynamic filter
PROCESS control	max. 12 dBu @ 5 kHz
LOW CONTOUR control	max. 12 dBu @ 50 kHz

System Data

Frequency response	25 Hz to 50 kHz, +/-3 dB
Signal-to-noise ratio	>95 dB, unweighted, 20 Hz to 20 kHz
Distortion (THD + N)	0.05% typ. @ +4 dBu, 1 kHz (IN/OUT)
Crosstalk	>75 dB

Power Supply

Mains Voltage

USA/Canada	120 VAC, 60 Hz
China/Korea	220 VAC, 50/60 Hz
Europe/UK/Australia	230 VAC, 50 Hz
Japan	100 VAC, 50-60 Hz
Export model	120/230 VAC, 50-60 Hz
Power consumption	approx. 12 W
Fuse	100-120 VAC: T 250 mA, H 250 V 220-240 VAC: T 125 mA, H 250 V

Dimensions/Weight

Dimensions (H x W x D)	approx. 8.5 x 1.8 x 19" approx. 217 x 44.5 x 483 mm
Weight	approx. 4.84 lbs / 2.20 kg

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