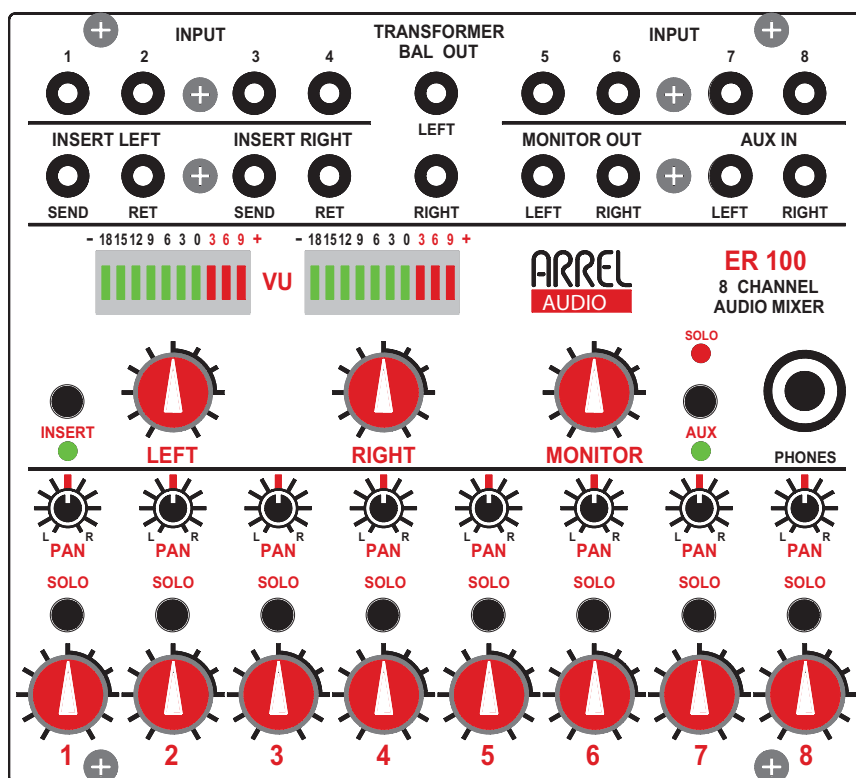




ER-100 Eurorack 8 Channel Stereo, Transformer Balanced Out Summing Mixer



User Manual

Issue 0.1

SAFETY INSTRUCTIONS



WARNING

Always follow the precautions listed below to avoid any possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

- Do not expose the instrument to liquids and rain. Do not use it near water or in damp or wet conditions, or place containers on it containing liquids. If any liquid seeps turn off the power and unplug the power cord from the AC outlet.
- Do not put burning items, such as candles, on the unit. A burning item may fall over and cause a fire.
- This instrument contains no user-serviceable parts. Do not open the instrument or attempt to disassemble or modify the internal circuit.
- Never insert or remove an electric plug with wet hands.
- Check the electric plug periodically and remove any dirt or dust which may have accumulated on it.
- Do not place the power cord near heat sources such as heaters or radiators, and do not excessively bend or otherwise damage the cord, place heavy objects on it, or place it in a position where anyone could walk on, trip over, or roll anything over it.



CAUTION

Always follow the precautions listed below to avoid any possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

- Do not connect the instrument to an electrical outlet using a multiple-connector. Doing so can result in lower sound quality, or possibly cause overheating in the outlet itself.
- When removing the electric plug from the instrument or an outlet, hold the plug itself and not the cord. Pulling by the cord can damage it.
- Remove the electric plug from the outlet when the instrument is not to be used for extended periods of time, or during electrical storms.
- Do not place the instrument in an unstable position where it might accidentally fall over.
- Before moving the instrument, remove all connected cables.
- When setting up the product, make sure that the AC outlet you are using is easily accessible. If some trouble or malfunction occurs, immediately turn off the power switch and disconnect the plug from the outlet. Even when the power switch is turned off, electricity is still flowing to the product at the minimum level.
- When you are not using the product for a long time, make sure to unplug the power cord from the wall AC outlet.
- Use only the stand/rack specified for the instrument. When attaching the stand or rack, use the provided screws only. Failure to do so could cause damage to the internal components or result in the instrument falling over.



Information for Users on Collection and Disposal of Old Equipment

This special symbol on the products, packaging, and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.

For proper treatment, recovery and recycling of old products, please take them to applicable collection points, in accordance with your national legislation and the Directives 2002/96/EC.

By disposing of these products correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.

For more information about collection and recycling of old products, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.

[For business users in the European Union]

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

[Information on Disposal in other Countries outside the European Union]

This symbol is only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.

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ARREL Audio is continuously working to the improvement of its systems and related documentation.
In any case, we reserve the right to change the specifications without notice but in the respect to the current legislation.

Disclaimer:

The information contained in this manual has been carefully checked and we believed is accurate at the time of publication.
In any case, we do not assume any responsibility for inaccuracies, errors or omissions nor any liability for any loss or damage resulting either directly or indirectly from use of the information contained in this manual.

TABLE OF CONTENTS

SAFETY INSTRUCTIONS	2
ARREL Audio Contacts	3
TABLE OF CONTENTS	4
INTRODUCTION	5
Housing.....	5
ER-100 Front Panel Controls and Operations	6
INPUT SECTION (CHANNELS 1-8)	6
Input gain knob.....	6
Input pan knob	6
Input solo IN PLACE button	6
OUTPUT SECTION	6
Insert Push Button	6
SEND/RETURN Left and Right Connectors.....	6
Left and righth master volume knobs	6
Main L/R Out	6
MONITOR SECTION	6
MONitor section GAIN	6
Solo LED	6
AUX button.....	7
Headphones TRS jack	7
Monitor Out	7
ER-100 FAQ.....	8
APPENDIX A: Front Panel	10
APPENDIX B: BLOCK DIAGRAM	11
TECHNICAL SPECIFICATIONS	12

INTRODUCTION

ARREL Audio Eurorack Stereo Transformer Balanced Out Summing Mixer is the answer to all stream mixing needs for EURORACK synthesizers. Its features set it apart from other similar products on the market due to a very high fidelity approach used for the design of the electronics together with the use of high quality line transformers to drive the L and R outputs. The internal circuits of the ER-100 have been directly derived from the ARREL Audio professional units in order to obtain maximum sonic performances.

The use of line transformers means a higher voltage output level (about 10 dB over the competitors), suitable to drive all modern audio converters. Output transformers mean also a very reliable connection in terms of unbalancing and ground loops problems.

The ER-100 is characterized by 8 input channels and a stereo output. Each channel is characterized by a pan pot control, a volume control and a solo in place push button (active on the monitor bus). A stereo insert (selection switch) is available on the main summing bus. The monitor section is characterized by volume control and an auxiliary input (control switch) (push button selection), suitable for monitoring DAC or general external inputs such as a CD and different signal sources. Two LED VU meters are available on the output bus. The AUX in can be used to send on line alternative mix.

Housing

The **ER-100** is contained in a 28 TE Eurorack units (142 mm) and by a depth of about 40 mm. No specific air conditioning is required for the unit, provided that there is a free flow of air through the rack from front to back and the temperature is maintained in the operating range. Consequently the racks may be stacked.

ER-100 Front Panel Controls and Operations

INPUT SECTION (CHANNELS 1-8)

INPUT GAIN KNOB

Rotate the level knob to change the gain. The level is controlled by a potentiometer (Fig.1). On the front panel Input Gain control the optimum working level is indicated with a ticker black line.

INPUT PAN KNOB

This is a -3.0 dB center pan, with S-Law shaping to help accurate panning to extremes of left and right (Fig. 1).

INPUT SOLO IN PLACE BUTTON

Press the solo button to send the channel to the monitor bus, more than one solo buttons in the on positions means that we will listen to the sum of the channels put in solo. Press again to turn-off the solo function (Fig. 1).

OUTPUT SECTION

INSERT PUSH BUTTON

Push the insert button to select the insert on the R and L output channels (Fig. 1). Press INSERT button to activate the insert. The INSERT is collocated on the main bus after the sum and before the main L/R volume controls.

SEND/RETURN LEFT AND RIGHT CONNECTORS

3.5 mm jack for the send/return on the left and right channel.

LEFT AND RIGTH MASTER VOLUME KNOBS

Rotate the L and R knobs to adjust the master level. On the front panel Master volume control the optimum working level is indicated with a ticker black line.

MAIN L/R OUT

3.5 mm jack for the L/R main balanced output.

MONITOR SECTION

MONITOR SECTION GAIN

Turn the MONITOR gain knob (Fig. 1) in order to select the required amount of gain for the monitor outputs. On the front panel Monitor volume control the optimum working level is indicated with a ticker black line

SOLO LED

LED on means that the SOLO function is activated.

AUX BUTTON

Push the button to select the auxiliary input (LED on). Press again to disconnect the auxiliary input. The AUX input is active on the monitor bus only (Fig.2).

HEADPHONES TRS JACK

Connect the headphone to this TRS jack. The headphone amplifier is able to drive headphones with impedance $> 50\Omega$.

MONITOR OUT

3.5 mm jack for the L/R monitor output

ER-100 FAQ

FAQ 1: Why the ER-100 is equipped with transformers on the line out L and R channels?

The two high quality (large bandwidth and high output level) output transformers are fundamentals in order to:

1. Increase the signal output level over the Eurorack standard level that is limited by the low power supply voltages (+12V/-12V).
2. Avoid any problem with ground loops due to the transformer galvanic isolation.
3. Avoid any problem when the output will be unbalanced. Transformer galvanic isolation assures that the output signals are floating with respect to the ground so you can unbalance without problems. The possibility to unbalance the L and R output signals can be very useful in a lot of live situation.

FAQ 2: Why the ER-100 is not a cheap equipment ?

The ER-100 is a high quality 8 channel mixer in a very compact format. The cost of the unit is high due to the following reasons:

1. ER-100 uses two high quality audio line transformers on the L and R line outputs, high quality transformers are very expensive.
2. The ER-100 is extremely compact. Please take into account that we offer, 8 channels, solo in place function, pan-pot, monitor out with high quality headphone amplifier supporting 50 ohm headphones, insert point, auxiliary input, and a flexible and accurate VU metering system. Implementing all these functions in the 28U format in about 40 mm of depth is a real engineering challenge. The unit is composed by 6 boards mounted over a motherboard so 7 boards in total so very compact and complex.
3. The ER-100 is based on high quality integrated circuits for audio applications. We have applied our experience in very high quality audio units for recording and live into the Eurorack world...
4. All the electromechanical components (potentiometers, switches, push buttons and jacks) used in the ER-100 are of top quality. We know very well that these components are the most critical for reliability. Moreover whenever possible we use the concept of "Electromechanical Fault Tolerance (see KEY-TECNOLOGIES link) to ensure very high reliability to our units.

FAQ 3: What is the function of the auxiliary input (AUX IN)?

The ER-100 AUX IN has exactly the same role as in a traditional mixer it is conceived as an auxiliary input on the Monitor. This input is not added to the 8 channels. When you select the AUX IN you disconnect the monitor from the summing solo bus and connect the auxiliary in to the monitor in order to hear only the signals connected to this input. The typical situation is when you have to monitor a recording. If you want easily check the song recorded with your Eurorack synth you can connect the recorder output to the AUX IN and easily check "on the fly" the recorded song just by switching the aux in on position. The AUX in can be used to check an alternative mix before send it on line.

FAQ 4: What is the function of the solo button?

1. The solo button permits to listen only the channels corresponding to the SOLO button switched in ON position all the others channels are muted. The function works on the Monitor Bus only. For example, if you want to listen only channel four (Monitor Out) you have to select SOLO ON on channel 4. If you want to listen the mix of channels 2 and four you have to select SOLO ON also on channel 2.

FAQ 5: Why there are no Control Voltages (CV) on the ER-100 ?

Because ER-100 is a very high quality traditional mixer in the Eurorack format. It is characterized by the maximum transparency and linearity with very low distortion in order to reproduce with maximum fidelity your sounds. The implementation of an amplifier or a pan pot controlled by a voltage means the use of VCAs (Voltage Controlled Amplifiers) or similar technologies that inevitably deteriorate the sound quality. ER-100 has not been conceived to be a "creative" mixer (in the sense of CV). ER-100 viceversa permits to the Eurorack user to have in his Eurorack case the power of a very high quality traditional mixer able to preserve all the sounds generated by the artist.

FAQ 6: How the ER-100 INSERT works ?

The stereo INSERT point of the ER-100 is connected to the main summing bus before the main L/R volume controls. You can easily use this stereo insert to connect whatever effect you want (compressors, EQs etc.) that works at line level. The insert can also be used for "on the fly" monitoring of a different signal source. To do this, connect the signal source output to the RETURN jack (the SEND jack is not used). The jack insertion disconnects the mixing bus from the L/R outputs and connects the alternative signal source to the L/R bus so can monitor whatever you want just by a jack insertion in the RETURN plug.

APPENDIX A: Front Panel

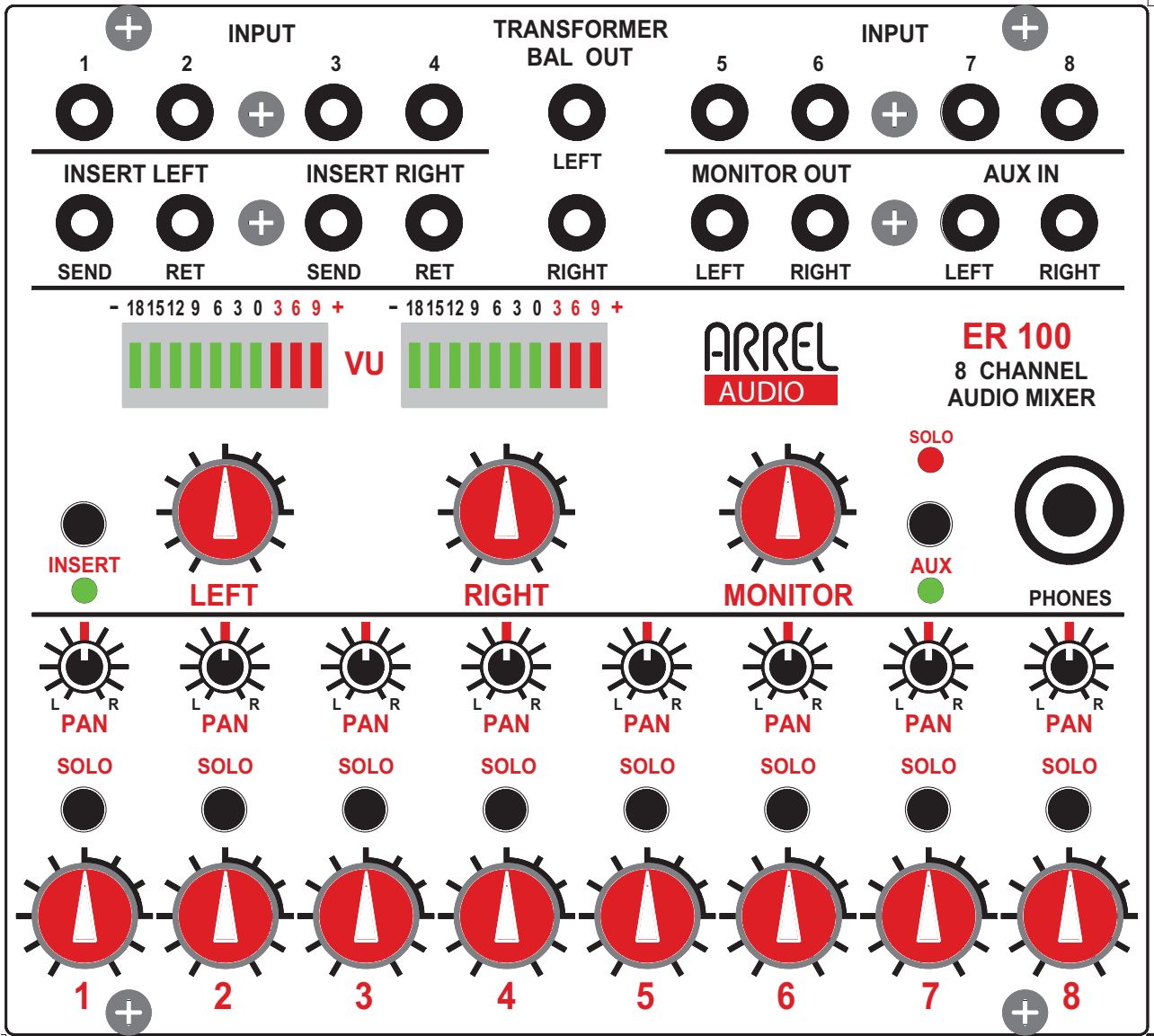


FIG. 1 ER-100 Front Panel

APPENDIX B: BLOCK DIAGRAM

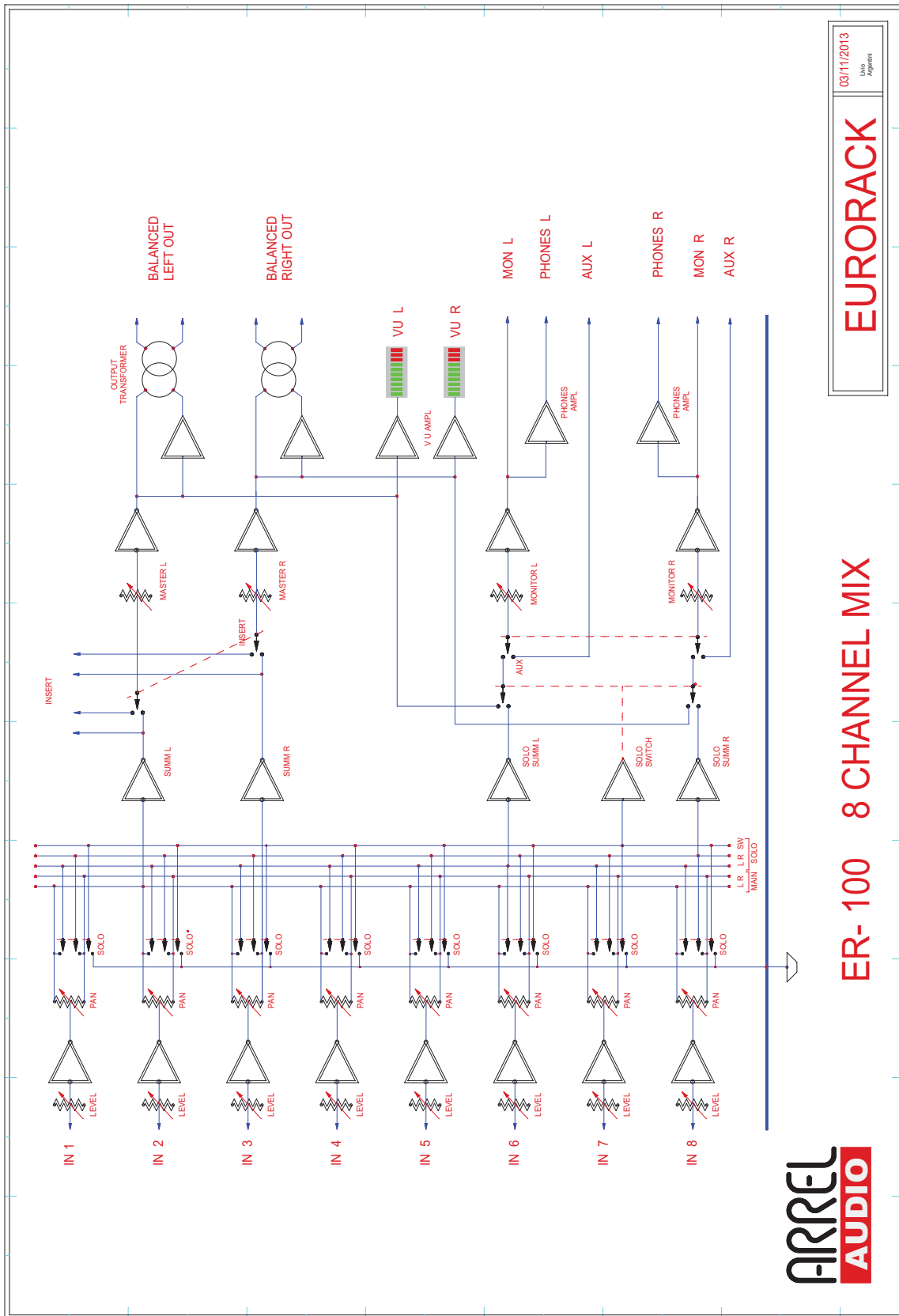


FIG. 2 ER-100 Block Diagram

TECHNICAL SPECIFICATIONS

Number of Channels	8
Power Supply	From the Eurorack power supply unit
Operating Voltage	+/- 12 VDC
Power Consumption	3.5 W
Input	Electronically unbalanced, Level -6 dBu max +30 dBu Impedance > 5 K Ω
Master Output	Transformer balanced and floating, Output Impedance optimum load impedance > 5K Ω)
Master Level	Level +4dBu, Max +26dBu,
AUX Input (DAC)	Stereo. Level 0 dBu, Imp. 10k Ω , unbalanced
Bandwidth	5 – 60.000 Hz -1dB, perfect square wave up to 20 KHz
Distortion + Noise	<0.005% (typical 0.001 %)
Front Panel Controls (each channel): Input Section	Channel Level control Pan Pot control Solo in Place button (LED)
Front Panel Controls: Insert Section	Stereo insert on Left and Right Selected by a button
Front Panel Controls: Master Section	Volume knob
Front Panel Controls: Monitor Section	Volume Knob
Front Panel Indicators	LED VU meters
Front Panel Connectors	8 x 3.5 mm jack for the input , 4 x 3.5 mm jack for the stereo insert 1 x 1/4" stereo jack for headphones Imp. >50 Ω 2 x 3.5 mm jack for the output 2 x 3.5 mm jack for the AUX input 2 x 3.5 mm jack for the monitor out
Rear Panel Power Supply Connectors	Eurorack power supply connector
Construction	28U TE Units (142mm)
Dimensions	142 mm x 128 mm (w x h)
Weight	500 g