

Not all power supplies are created equal

Custom Boards Finland

6–8 minutes

There are only a small number of manufacturers, who have dedicated themselves to the art of making pro-grade power supply units (PSUs) for pedal effects. The best-known companies are [Voodoo Lab](#) and [Cioks](#), who produce about 90 % of all power supplies between them. You will find their products in Custom Boards' product selection.

If you are unsure how to determine the right size of power supply, and how to install it correctly, please check out our "[Pedal Power Service](#)".



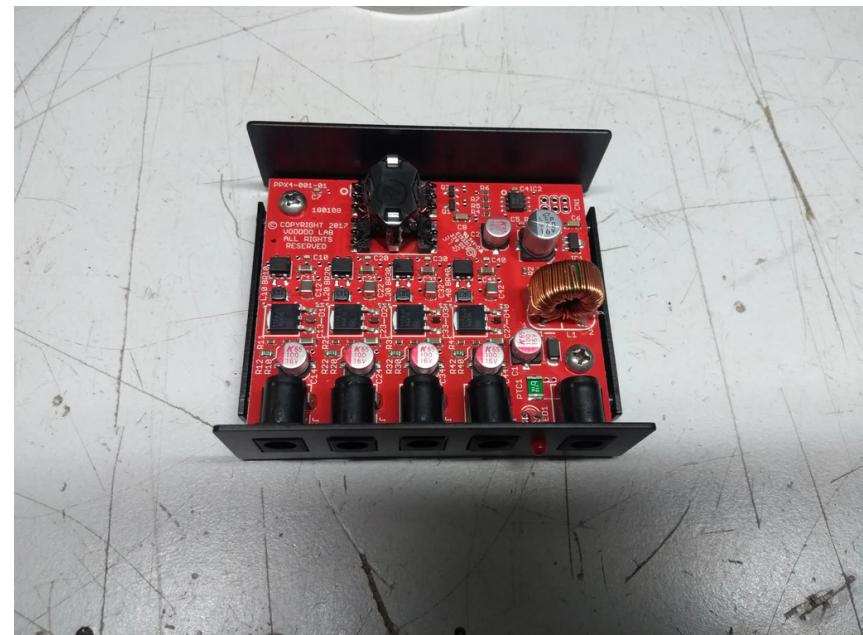
Voodoo Lab and Cioks use several different methods to convert the AC from the wall power grid to the power needed for guitar effects. More affordable models use different transformers from those included in the most expensive units. The quality of the transformers, as well as how many are used, have a direct bearing

on the production costs, and thus on the price of a power supply. Great engineering even makes it possible to use some relatively affordable parts in high-quality power supplies that are fit for professional use.

Modern switched-mode power supplies

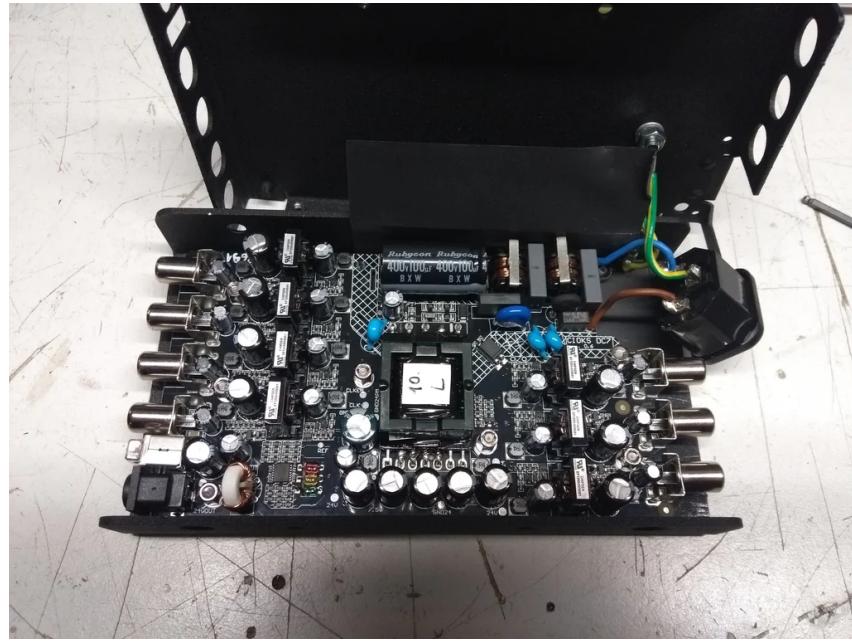
A most modern type of design has started to make headway into the pedal power supply segments – the switched-mode power supply (aka switch-mode or switching-mode). This design has been in existence for quite a while now, but only more recent designs can be used for audio applications. These lightweight power supplies are commonly used in phone and tablet chargers, for example. Its greatest advantage is that a switched-mode design doesn't react to external magnetic fields as the traditional designs do.

New breakthroughs in this field have made it possible to use this design in serious audio devices, and some of the power supply brands have started introducing switched-mode designs for pedalboards. Now that the audio filtering has become excellent, manufacturers can implement the advantages of these designs – namely, their universality regarding the AC-voltage input, and the high currents switched-mode power supplies are able to offer.



It isn't hard to predict the advent of many more switched-mode

PSUs in the future, as progress has a way of moving forward and the required technical knowhow becomes ever-more accessible.

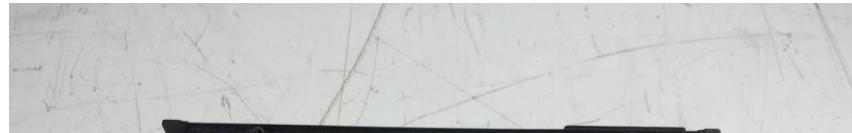


Custom Boards offers the following modern switched-mode power supplies:

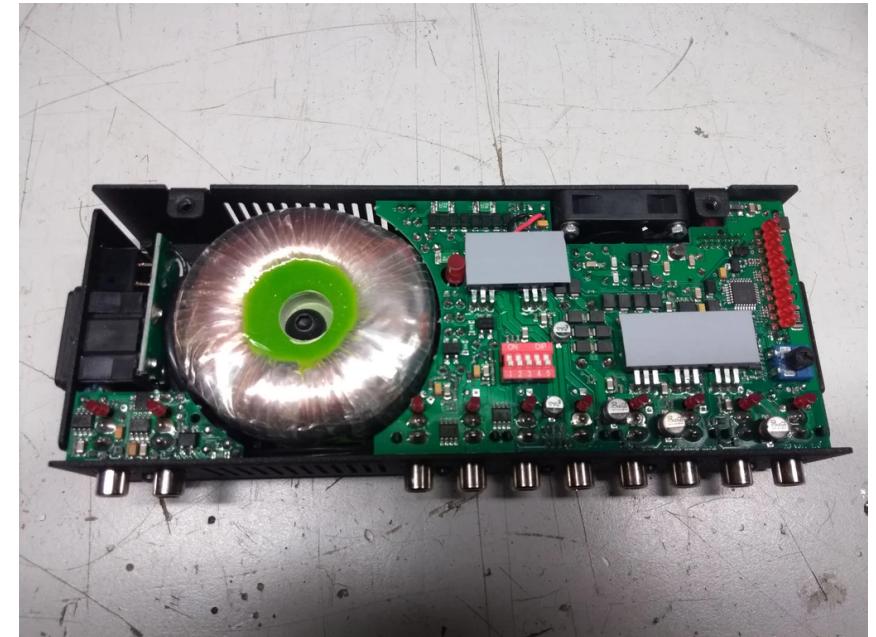
- [VOODOO LAB PEDAL POWER X4](#)
- [VOODOO LAB PEDAL POWER X4 EXPANDER KIT](#)
- [CIOKS DC7](#)
- [CIOKS 4](#)
- [CIOKS 4 EXPANDER KIT](#)
- [CIOKS 8 EXPANDER KIT](#)

Toroidal transformers

Traditional power supplies are fully analogue designs, with the best of them using toroidal transformers. A toroidal transformer has proven to be the best type for supplying effect pedals with power. Its output is very stable and quiet, and it's not fazed by small drifts in the incoming AC-power or changes in the current draw of the connected pedals.



The toroidal transformer also provides a very compact solution to offering larger currents for digital effects. Its design also produces a much smaller magnetic field than older transformer designs, meaning there's less electromagnetic hum induction into the guitar signal.



The toroidal transformer power supplies in Custom Boards' selection are:

- [VOODOO LAB PEDAL POWER 2 PLUS](#)
- [VOODOO LAB PEDAL POWER 4X4](#)
- [VOODOO LAB PEDAL POWER ISO-5](#)
- [VOODOO LAB PEDAL POWER MONDO](#)

- [CIOKS DC5 LINK](#)
- [CIOKS DC10 LINK](#)
- [CIOKS DC10](#)
- [CIOKS AC10](#)
- [CIOKS CIOKOLATE](#)

Laminated transformers

The second type of transformer used in pedalboard power supplies are laminated transformers – also called laminated-core transformers or stack transformers. A laminated transformer is cheaper to produce, which means that this type is mostly found in more affordable power supplies.



Their main drawback is a larger magnetic field, which can make a power supply noisier, especially on crammed pedalboards, or boards with a more complicated signal cabling. Another drawback lies in the fact that – all other specifications being equal – a laminated transformer isn't able to deliver as high currents as a toroidal counterpart. This means that a laminated transformer won't be able to deliver enough amperes for digital effects.

Nevertheless, a laminated transformer is a part very commonly used in many fields, and you can achieve professional, hum-free

results with them, too, as long as you plan your pedalboard's layout and cabling thoroughly.

Custom Boards has the following laminated transformer PSUs in their selection:

- [CIOKS ADAM LINK](#)

Rechargeable power supplies

A cableless pedalboard seems very enticing idea. Over the last few years some manufacturers have introduced power supplies that run on rechargeable batteries. Rechargeable power supplies are a genuine option for use with traditional analogue pedals, where they can power a small pedalboard for hours.



Their main drawback of rechargeable power supply is that digital pedals will drain the battery dry relatively fast. We'd recommend this option mainly with analogue pedals that require less than 100 mA per pedal. If your small pedalboard includes a tuner, an overdrive, a booster and a chorus, a rechargeable power supply might be enough to power the board for a number of days. At the end of the day, these kind of power supplies should be thought as a replacement for 9 V Alkaline batteries. If your goal is to save batteries and run battery-operated effects, rechargeable power supply serves you well!

Small shell form transformers

The traditional analog power supplies – often called wall-warts – meant for single pedals – like Boss, Ibanez or Electro-Harmonix – are using small shell form transformers. Most of these single power

supplies are designed in exactly the same way, and are possibly just rebranded versions of OEM models, made by a row of different factories over the decades.



This type of power supply generally works fine, when only a single analogue pedal is in use. Most of these devices give out only 200 mA of current, which means their use is limited. Nowadays many effects draw much larger currents than a traditional analog wall-wart can offer, which is why they're becoming an increasingly infrequent sight. Because this type of power supply is not a viable option for a pro-grade pedalboard, we don't carry wall-warts in our selection.

If you have purchased all the parts and components but get a feeling that you might not be up to the task after all, we can make your pedalboard for you, using the components you have bought from us. Don't worry, we won't let anything go to waste.

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