**Тема:** «Виды источников питания»

**Цель:** Повторить грамматический материал по теме, продолжить изучать глоссарий по теме проф.блока «источники питания».

**Задачи:** Отработать навык работы (в т.ч. перевода) с профессиональной лексикой по теме профессионального блока, повторить тематический материал, актуализировать имеющиеся знания.

**Специальность:** ОГСЭ.03. 13.00.00 и 15.00.00

**Время выполнения:** 90 минут

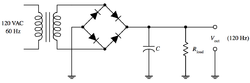
1. **Translate the glossary**
2. **read the text**
3. **do the tasks**

**Types of power supply**

**DC power supply**

A DC power supply is one that supplies a constant DC voltage to its load. Depending on its design, a DC power supply may be powered from a DC source or from an [AC](https://en.wikipedia.org/wiki/Alternating_current) source such as the power mains.

#### AC-to-DC supply

[](https://en.wikipedia.org/wiki/File:ACtoDCpowersupply.png)

Schematic of basic AC-to-DC power supply, showing (from L-R) transformer, full-wave bridge rectifier, filter capacitor and resistor load

*DC power supplies use AC*[*mains electricity*](https://en.wikipedia.org/wiki/Mains_electricity)*as an energy source. Such power supplies will employ a*[*transformer*](https://en.wikipedia.org/wiki/Transformer)*to convert the input voltage to a higher or lower AC voltage. A*[*rectifier*](https://en.wikipedia.org/wiki/Rectifier)*is used to convert the transformer output voltage to a varying DC voltage, which in turn is passed through an*[*electronic filter*](https://en.wikipedia.org/wiki/Electronic_filter)*to convert it to an unregulated DC voltage.* The filter removes most, but not all of the AC voltage variations; the remaining AC voltage is known as *ripple*. The electric load's tolerance of ripple dictates the minimum amount of filtering that must be provided by a power supply. In some applications, high ripple is tolerated and therefore no filtering is required. For example, in some battery charging applications it is possible to implement a mains-powered DC power supply with nothing more than a transformer and a single rectifier diode, with a resistor in series with the output to limit charging current.

#### Switched-mode power supply

*In a*[*switched-mode power supply*](https://en.wikipedia.org/wiki/Switched-mode_power_supply)*(SMPS), the AC mains input is directly rectified and then filtered to obtain a DC voltage. The resulting DC voltage is then switched on and off at a high frequency by electronic switching circuitry, thus producing an AC current that will pass through a*[*high-frequency*](https://en.wikipedia.org/wiki/High-frequency)*transformer or inductor.* Switching occurs at a very high frequency (typically 10 kHz — 1 MHz), thereby enabling the use of [transformers](https://en.wikipedia.org/wiki/Transformer) and filter capacitors that are much smaller, lighter, and less expensive than those found in linear power supplies operating at mains frequency. After the inductor or transformer secondary, the high frequency AC is rectified and filtered to produce the DC output voltage. If the SMPS uses an adequately insulated high-frequency transformer, the output will be [electrically isolated](https://en.wikipedia.org/wiki/Galvanic_isolation) from the mains; this feature is often essential for safety.

Switched-mode power supplies are usually regulated, and to keep the output voltage constant, the power supply employs a feedback controller that monitors current drawn by the load. The switching [duty cycle](https://en.wikipedia.org/wiki/Duty_cycle) increases as power output requirements increase.

#### Linear regulator

*The function of a*[*linear voltage regulator*](https://en.wikipedia.org/wiki/Linear_regulator)*is to convert a varying DC voltage to a constant, often specific, lower DC voltage. In addition, they often provide a*[*current limiting*](https://en.wikipedia.org/wiki/Current_limiting)*function to protect the power supply and load from overcurrent (excessive, potentially destructive current).*

A constant output voltage is required in many power supply applications, but the voltage provided by many energy sources will vary with changes in load impedance. Furthermore, when an unregulated DC power supply is the energy source, its output voltage will also vary with changing input voltage. Linear regulators can also reduce the magnitude of ripple and noise on the output voltage.

### AC power supplies

*An AC power supply typically takes the voltage from a wall outlet (*[*mains supply*](https://en.wikipedia.org/wiki/Mains_supply)*) and uses a transformer to step up or step down the voltage to the desired voltage.* Some filtering may take place as well. In some cases, the source voltage is the same as the output voltage; this is called an [isolation transformer](https://en.wikipedia.org/wiki/Isolation_transformer). Other AC power supply transformers do not provide mains isolation; these are called [autotransformers](https://en.wikipedia.org/wiki/Autotransformer); a variable output autotransformer is known as a [variac](https://en.wikipedia.org/wiki/Variac" \o "Variac). Other kinds of AC power supplies are designed to provide a nearly [constant current](https://en.wikipedia.org/wiki/Current_source), and output voltage may vary depending on impedance of the load. In cases when the power source is direct current, (like an automobile storage battery), an [inverter](https://en.wikipedia.org/wiki/Power_inverter) and step-up transformer may be used to convert it to AC power. Portable AC power may be provided by an [alternator](https://en.wikipedia.org/wiki/Alternator) powered by a diesel or gasoline engine (for example, at a construction site, in an automobile or boat, or backup power generation for emergency services) whose current is passed to a regulator circuit to provide a constant voltage at the output.

#### AC adapter

Switch-mode mobile phone charger. An AC adapter is a power supply built into an [AC mains power plug](https://en.wikipedia.org/wiki/Domestic_AC_power_plugs_and_sockets). AC adapters are also known by various other names such as "plug pack" or "plug-in adapter", or by slang terms such as "wall wart". AC adapters typically have a single AC or DC output that is conveyed over a hardwired cable to a connector, but some adapters have multiple outputs that may be conveyed over one or more cables. "Universal" AC adapters have interchangeable input connectors to accommodate different AC mains voltages.

Adapters with AC outputs may consist only of a passive [transformer](https://en.wikipedia.org/wiki/Transformer) (plus a few diodes in DC-output adapters), or they may employ switch-mode circuitry. AC adapters consume power (and produce electric and magnetic fields) even when not connected to a load; for this reason they are sometimes known as "electricity vampires", and may be plugged into [power strips](https://en.wikipedia.org/wiki/Power_strip) to allow them to be conveniently turned on and off.

1. **Translate the lines given in italics.**
2. **Answer the questions:**
3. What power supply is more preferable at working with mobile equipment?
4. What is a rectifier used for?
5. What does a linear regulator do?
6. Why does AC adapters are called an "electricity vampires”?
7. What is the basic principle of SMPS functioning?
8. **Fill in the gaps with the words from you glossary.**
9. This power supply is wrecked. It won’t transform the output voltage. I guess the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is dead.
10. If you have such a high voltage at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, your device is about to burn.
11. The main goal of using the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is to convert a varying DC voltage to a constant.
12. I see that the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is violated. How could you break the wire frame, guys?
13. All your gadgets consumes loads of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. How will you pay the bills?
14. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of this Power supply is pretty short. I don’t really know how it will affect the load
15. **Translate into English, use your glossary to translate an underlined words:**
16. Больницы оборудованы резервными генераторами. Это необходимо.
17. Как выглядит розетка? – Как пятачок.
18. Что делать с остатками деталей? – Оставить в качестве вещ доков.
19. Взаимозаменяемые детали лучше отложить в другую коробку.
20. Ионистор подключен к нагрузке, не трогай его!