

Universal power supply with breadboard. The power supply has a jumper (stepped setting – 1.5V, 3.3V, 5V or 9V) and the potentiometer to adjust the output voltage. Power supply with breadboard facilitates rapid prototyping without the need for soldering.

Specifications

- output voltage regulation: stepped with jumper and smoothly with potentiometer
- maximum supply current: 1.5A
- built-in power supply output voltage range: 12...24V DC
- protected from reverse polarity
- possibility of obtaining two voltages to supply breadboard

Functional description

Schematic of the power supply is shown in Figure 1. The power supply was built using the well-known LM317 voltage regulator (US1). Its maximum output current is 1.5A. The LM317 is protected against overload, has built-in current limiter and overheating protection. Its application requires only two external resistors to set the output voltage. Two-row goldpin and jumper are used for the output voltage setting. The user can also insert a jumper in place marked "REG" and use the PR1 multi-turn potentiometer to precise set the desired output voltage. Connector J3 connects to the breadboard the voltage from the connector X1 or X2 (supply voltage from inputs of the

stabilizer) minus the voltage drop on the diode D1. Thanks to this, two voltages can be obtained on the breadboard, for example + 5V (from stabilizer output) and + 12V (from stabilizer input). The diode D1 has been used for protection against reverse polarity. The plate should be supplied with a DC voltage within range from 12 to 24V. The US1 is equipped with a heat sink that dissipates power losses to the environment. The PCB can be powered through the X1 or "DC". The "DC" connector fits 5.5/2.5 or 5.5/2.1 plugs used in many wall power supplies. The supply voltage is indicated by a green LED (D2).



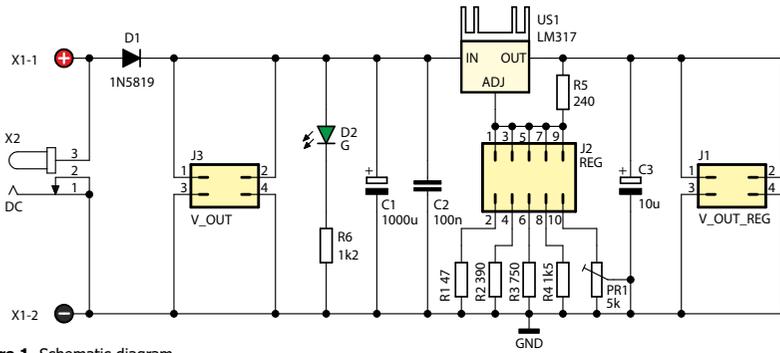
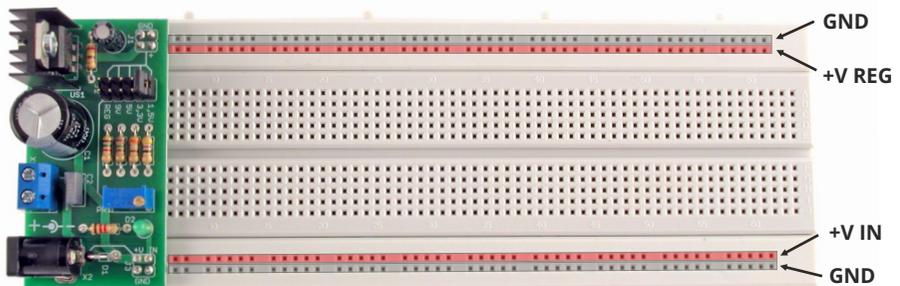
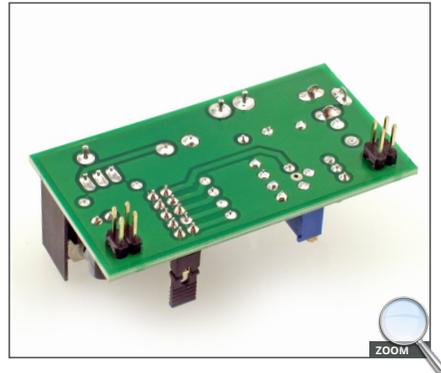


Figure 1. Schematic diagram

Assembly and test

Assembly is typical and should not cause problems. Assembly of the device starts with resistors and other small-sized components, and ends with the installation of electrolytic capacitors and screw terminal.

The photos show the model of the power supply with breadboard.



DIFFICULTY LEVEL



Start off by soldering the printed circuit elements in order from smallest to largest. The unit assembled flawlessly, using the supplied components will operate immediately after switching on the power supply.

Component list

Resistors:

- R1:..... 47Ω (yellow-violet-black-gold)
- R2:.....390Ω (orange-white-brown-gold)
- R3:..... 750Ω (violet-green-brown-gold)
- R4:.....1,5kΩ (brown-green-red,gold)
- R5:..... 240Ω (red-yellow-brown-gold)
- R6:.....1,2kΩ (brown-red-red-gold)
- PR1:.....square trimming potentiometer 5kΩ

Capacitors:

- C1:.....1000μF !
- C2:.....100nF
- C3:.....10μF !

Semiconductors:

- D1:1N5819 !
- D2:green LED diode !
- US1:LM317 !

Others:

- J1, J3:.....goldpin connector 2×2
- J2:.....goldpin connector 2×5 + jumper
- X1:.....2-pin terminal block connector
- X2:.....DC 2.1/5.5
- Heat sink + screw

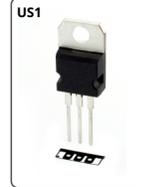
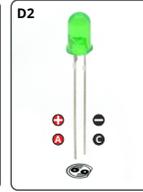
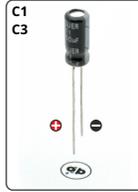


While assembling the components marked with an exclamation mark attention should be paid to their polarity. Symbols of the components on the PCB as well as photos of assembled sets may come in useful. To access high-resolution images, download the PDF file.

<http://bit.ly/2tzd0Sj>



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Assembly in 4 steps

