

Power Supply Tutorial

Tektronix PS280/ GwInstek GPC-3030D



The Tektronix PS280 and GwInstek GPC-3030D power supplies contain three separate power supplies: two variable supplies and one fixed +5V supply.

Fixed +5V Supply

The two terminals on the right side deliver a fixed +5 Volts with a maximum current of 3A. The red terminal is positive and the black is negative.

Variable Positive Supply

There are two independent variable supplies that can provide a positive voltage between 0 and 30V with a maximum current of 2A. Switch to Independent Mode by placing the Tracking buttons in the out position. To generate a positive voltage from the variable supply on the right side, for example, the ground of the circuit (black lead) is connected to the negative terminal, the voltage (red lead) is connected to the positive terminal (see Figure 1 below). The voltage is adjusted using the Voltage Knob.



Figure 1: Single Positive Supply. The black lead is ground and the red lead is +6V.

Setting the Maximum Current

The Current knob is used to set the maximum amount of current that the supply will deliver. Most circuits require only a small amount of current, so the Current knob should be set to just above the minimum level by turning the Current knob all the way counter-clockwise until the C.C. (current control) light turns on, and then back clockwise a small amount until the red C.C. light goes out.

The red C.C. (current control) light indicates that the supply is delivering the maximum amount of current that is allowed by the Current knob setting, in which case the output voltage has been

reduced to limit the output current. This condition usually indicates either that the Current knob is set too low or the circuit is drawing too much current for some reason, such as the power supply has been accidentally shorted out. Either way, if the red C.C. light is on, then you need to fix the problem in order to get the proper voltage from the power supply.

Negative Voltages

Since all three of the supplies in this unit are floating (which means that neither output terminal is internally connected to earth ground), negative voltages can be produced by switching the polarity of the connections so that the ground of the circuit (black lead) is connected to the positive side of the power supply and the voltage is taken from the negative side (see Figure 2).



Figure 2: Single Negative Supply. The black lead is ground and the red lead is -6V.

Dual Supplies

In some circuits we need both a positive and a negative power supply voltage, which can be generated by connecting two of the power supplies as shown in Figure 3 where one of the supplies is connected with the negative terminal to ground and the other supply is connected with the positive terminal to ground. The voltages do not need to be set to the same value, so it is possible to generate +6V and -12V for example.

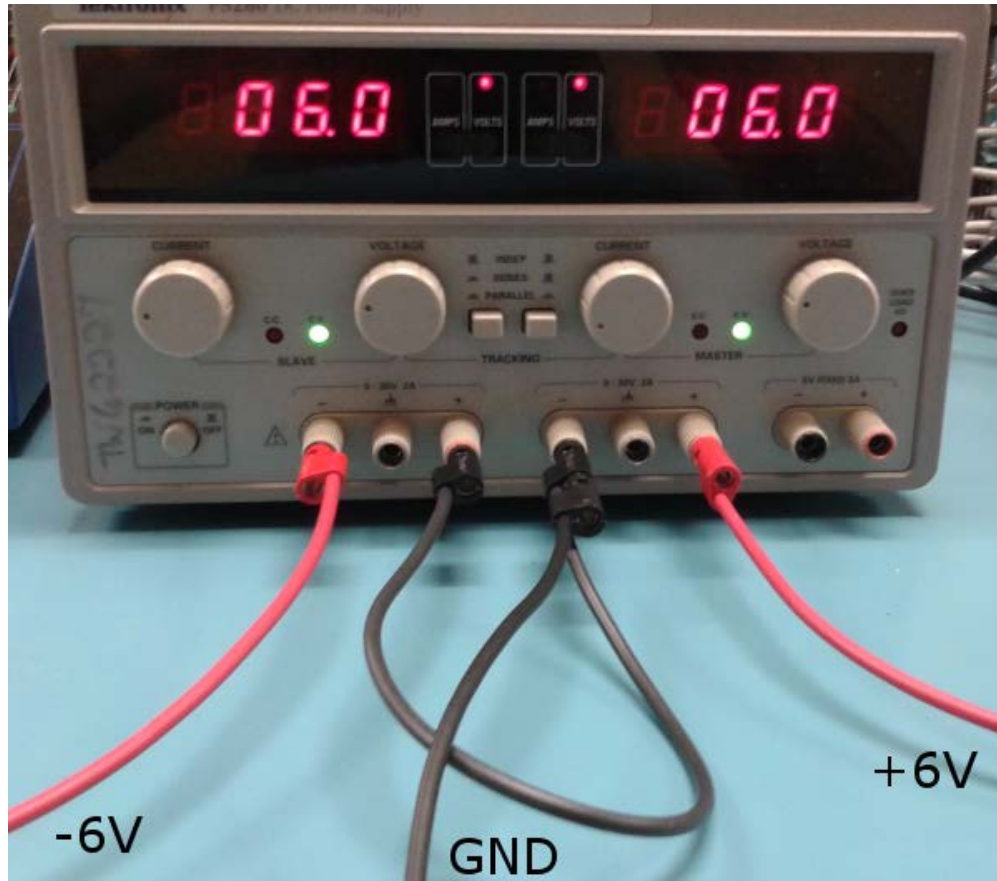


Figure 3: Dual Supply. The black lead is ground, the red lead on the right is +6V, and the red lead on the left is -6V.

Series Mode

The supply can operate the two variable supplies in series by setting the Tracking buttons so that the left tracking button is in and right button is out. Allows the supply to generate up from 0 to 60V with 2A maximum.

Parallel Mode

If both tracking buttons are in, the two variable supplies work in parallel to produce a single voltage from 0 to 30V with up to 4A.