

Low Cost Alternatives to Bench Top Power Supplies

By Mel Berman

Traditional bench top power supplies are used by engineers and test personnel for the purpose of evaluating and testing electronic circuits and sub-assemblies. The primary advantage of bench top power supplies is their ability to adjust their output voltage over a very wide range. Since bench top supplies typically include meters, displays, numerous parametric set-points, control knobs, alarms, indicators, and sometimes digital interfaces, they tend to be more complex and expensive than standard power supplies.



Typical Bench Top Power Supply (TDK-Lambda's ZUP series)

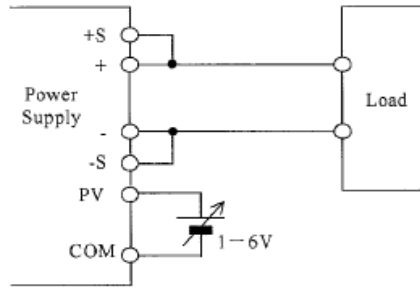
In some cases, all the bells and whistles associated with bench top supplies may not be required. In these instances employing a standard power supply with a wide-range adjustable output can get the job done at a substantial cost savings. Standard switchmode power supplies that feature wide range adjustable outputs can be controlled in one or both of the following methods. In some cases an external voltage (e.g., 1-6V) or an external potentiometer (e.g., 50k ohms) can be used to adjust these power supplies over a very broad range of output voltages.

External Voltage Control

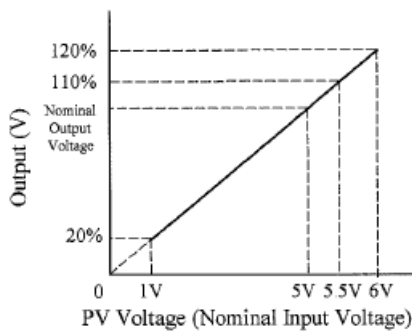
In this example an external variable voltage of 1V to 6V is connected to the designated input of the power supply, sometimes called the PV (Program Voltage) input. As this external control voltage is varied it will cause the output voltage to change in a fairly linear fashion over a wide range of about 20% to 120% of the nominal rated output voltage. Below are diagrams showing an example of this type of remote voltage adjustment for TDK-Lambda's SWS-L and HWS/PV series (300W and higher) of power supplies.



600W Power Supply with Wide Adjustable Output Range (SWS600L)



External Variable Voltage Control (1-6V)



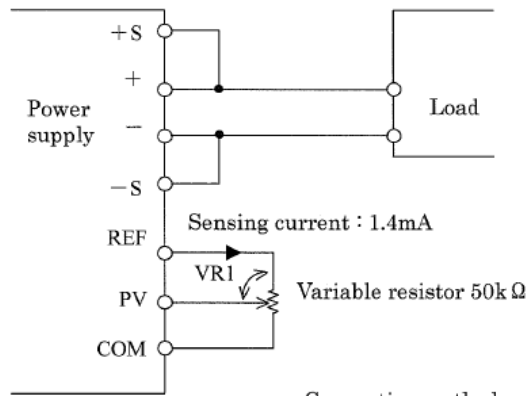
Output Voltage Change (20-120%) with Ext. Variable Voltage Control (1-6V)

Variable Resistive Control

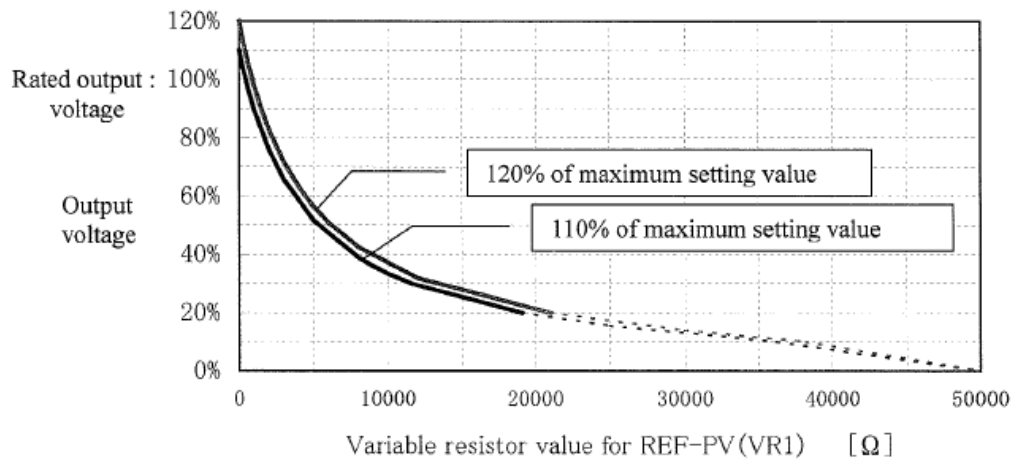
Some power supplies can be remotely adjusted via an external potentiometer. This method has the advantage that an external voltage is not required since an internal reference voltage is provided by the power supply. As the external resistance changes, it will cause the output voltage to change (non-linear) over a wide range of about 20% to 120% of the nominal output voltage, as shown in the diagrams below for TDK-Lambda's HWS series (1000-watt and higher).



1000W Power Supply with Wide Adjustable Output Range (HWS1000)



External Variable Resistive Control (50k ohm pot.)



Output Voltage Change (20-120%) with Ext. Variable Resistive Control (50k ohm pot.)

Additional information about the power supplies mentioned in this article can be found at TDK-Lambda's web site: www.us.tdk-lambda.com/lp or call 1-800-LAMBDA-4.