

Can I use a dual output DC-DC converter to get a higher voltage single output?

In this white paper, which is intended for electronics engineers and designers working with power systems for scientific, broadcast or general industrial equipment, explains when it is possible to use a dual output DC-DC converter to get a higher voltage single output.

References

www.emea.lambda.tdk.com/uk//medical

www.emea.lambda.tdk.com/uk/industrial

www.emea.lambda.tdk.com/uk/ccg30

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Many low power DC-DC converter series offer 5V, 12V and 15V single and +/-12V and +/-15V dual output models. If a 24V single output is required, it is possible to configure most dual +/-12V output models to provide that voltage.

To see how this can be achieved, let us review the block diagram of the 15W and 30W TDK-Lambda CCG series +/-12V dual output for example shown in Figure 1.

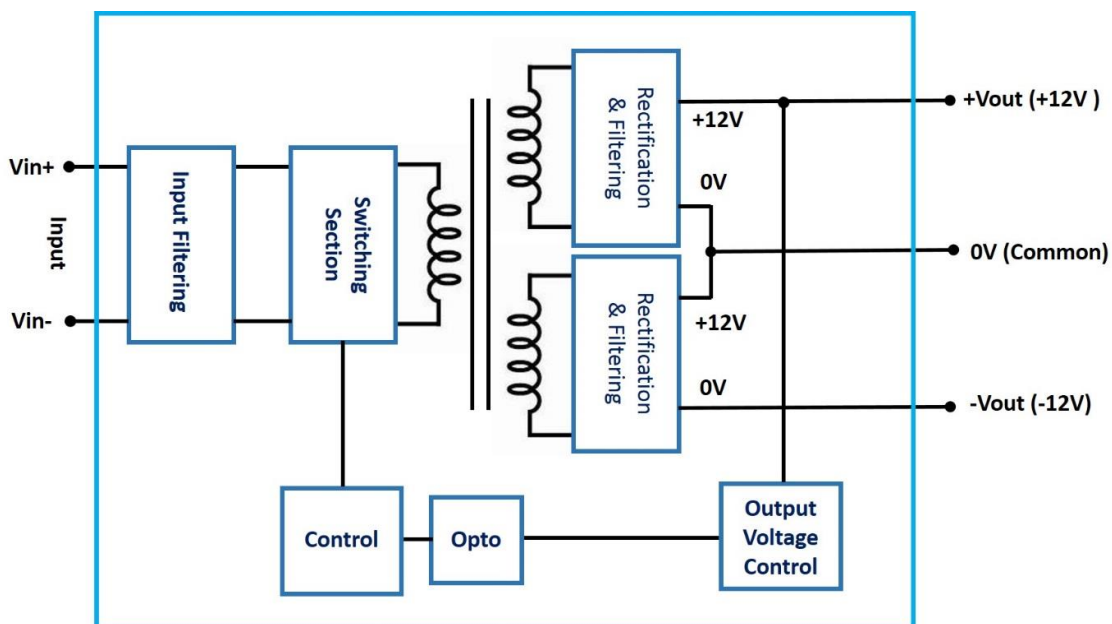


Figure 1: A dual output DC-DC converter providing a +/-12V output

Internally, there are two secondary transformer windings, which are individually rectified and filtered to provide two 12Vdc outputs. The +12V of the top circuit provides the +12V output and the 0V of the bottom circuit the -12V output. Internally the 0V of the top circuit is connected to the +12V of the bottom circuit, effectively putting them in series. That point is provided to the user as the 0V (common) pin. Figure 2 shows how to use this +/-12V model to give a single 24V output.

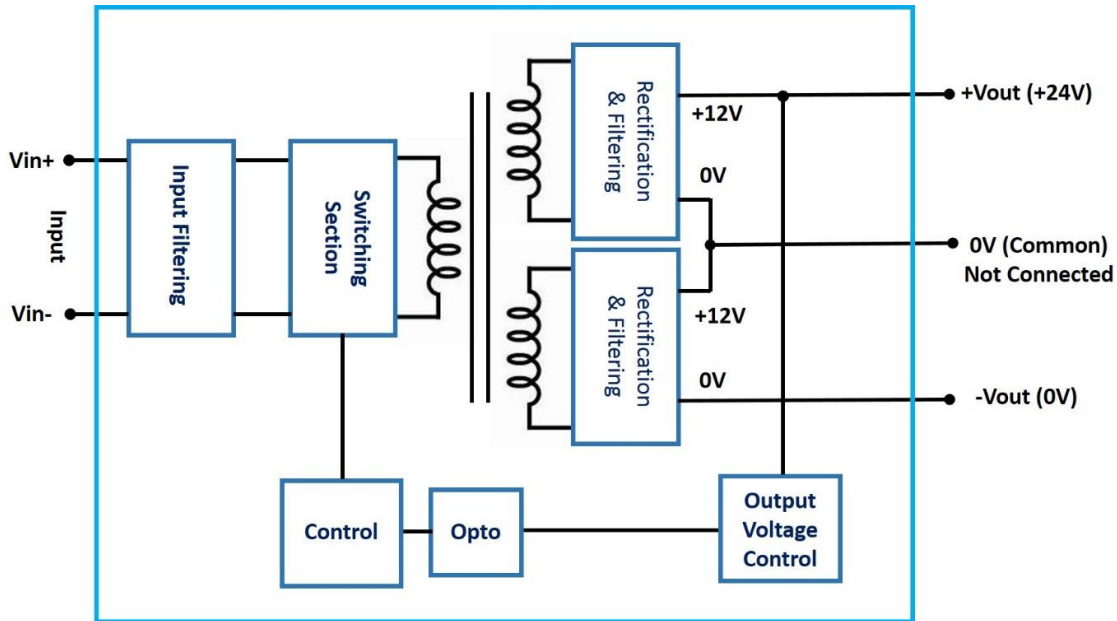


Figure 2: A dual output DC-DC converter providing a 24V output

No changes have been made inside the converter, the two 12V outputs are still electrically connected in series. In this case the 0V common pin is not connected and when load connected across the +Vout and -Vout pins it will be supplied with 24V.

The rated output current is the same as the dual output current. For example, if the dual output rating is +12V at 1.25A and -12V at 1.25A, then the single output is rated at 24V 1.25A.

Likewise, a dual output +/-15V converter can be configured to supply 30V or a dual output +/-5V model 10V. The industry standard dual output converters do not have a trim pin, so the output voltage will not be adjustable.



Figure 3: TDK-Lambda's CCG30-48-12D

Always confirm with the manufacturer if their datasheet does not state it can be used as a single output.

For more information about medical power supplies from TDK-Lambda, please visit:

www.emea.lambda.tdk.com/uk//medical

www.emea.lambda.tdk.com/uk/industrial

www.emea.lambda.tdk.com/uk/ccg30

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