

Connecting AC-DC and DC-DC Power Converters in Parallel

Aimtec's power converters are offered in a wide range of Output Power and Output Voltages. This gives the opportunity to use them in a "stand-alone" configuration or connected in parallel or in series.

Why connect in parallel:

Some of the applications for connecting power modules in parallel include:

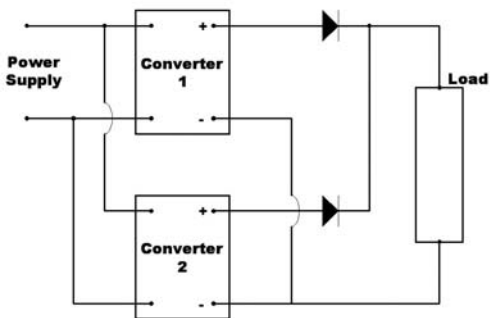
- To increase the Output Power capability on the supplying unit by connecting 2 or more converters in parallel.
- To provide redundancy and to ensure that the system remains functional should a single power module fail.

There are other advantages to using parallel connections of power converters, such as:

- In applications where space is limited, using 2 or more lower power converters often consumes less of the valuable space on the PCB board than a single higher power module.
- The use of multiple power modules distributes the thermal heat load over a larger board area.
- Higher power requirements can be achieved using lower power modules in parallel

How to connect in parallel:

Figure 1



Ideally, the modules should be connected in parallel as it is shown on the Figure 1.

Ideally, the Output current will be shared equally between two converters, if they are identical.

It is important that each of the paralleled modules have approximately the same impedance between their Outputs and then the common load on the Output connection should be symmetrical.

If one or more parameters are different, imbalance of output converter current will occur.

When connecting two converters in parallel, the +Vout signals should be tied together with a low impedance connection by a large plane type connection of the circuit board. The same configuration should be implemented for the -Vout signal.

To reduce the ripple current at the minus input connection and to improve paralleled performance of DC-DC converters connected in parallel, it is recommended that a capacitor be placed at the input of each module.

When redundancy is required or when 3 and more converters are connected, a diode needs to be connected in series with the positive output of each paralleled module. This will prevent a unit that has short failure at the Output from shorting out the entire load.

Connecting AC-DC and DC-DC Power Converters in Parallel

If the Aimtec converters used include a trim option, then output trimming generally is not required in parallel configuration. However, if required, it is recommended to use individual trim resistors on each module.

If it is needed, separate fusing at the input of each module is also required to prevent a unit that has short failed at the input from shorting out the input on the other units.

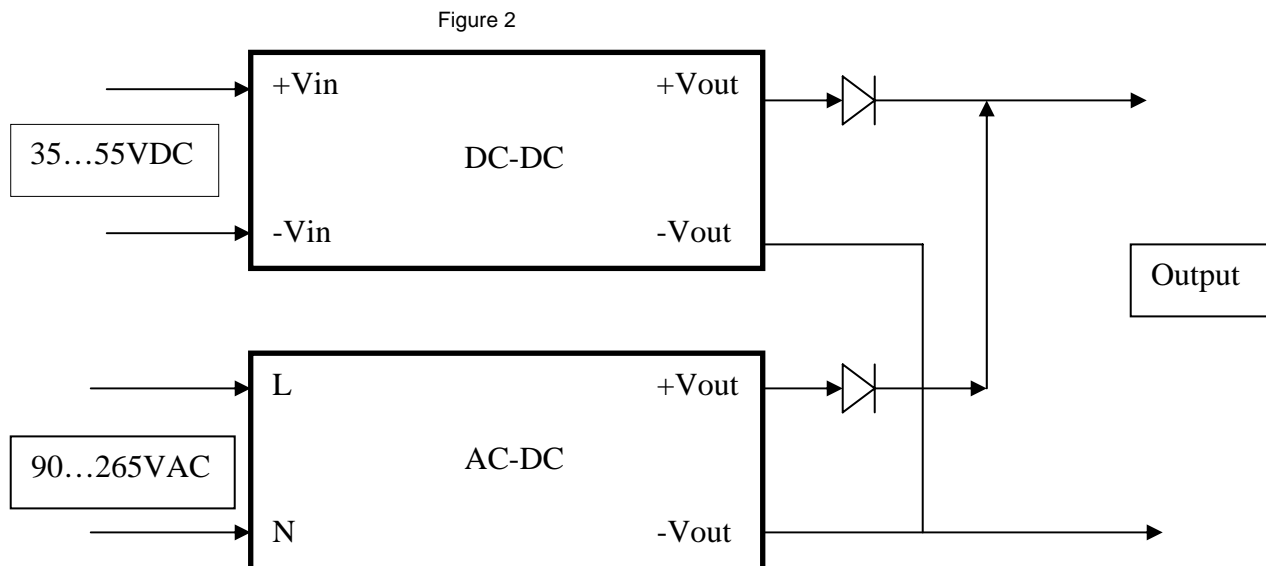
This application applies for identical Aimtec part numbers of AC-DC Converter(s) or multiple DC-DC Converter(s).

There is also the possibility of connecting AC-DC converter(s) in parallel with DC-DC Converter(s) to make an Uninterruptible Power Supply,

Uninterruptible Power Supply using an AC-DC Converter and a DC-DC Converter Connected in Parallel

The system shown in Figure 2 is used with an AC input and a DC input from a battery. Together the two converters form an Uninterruptible Power Supply (UPS) and are used as a battery back-up in the event of an AC power interruption.

Both converters have the same output voltage and power, with their outputs connected in parallel through decoupling diodes.



Notes: Information furnished is believed to be accurate and reliable. However, Aimtec Inc. assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Aimtec Inc. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. Aimtec Inc. Products are not authorized for use as critical components in life support devices or systems without express written approval of Aimtec Inc. © 2006 Aimtec Inc. – All Rights Reserved