

Cascaded Converters Vs. Single Stage Conversion

Cascaded power converters have occasionally been used in 270 VDC and 120 VDC applications because of a scarcity of converters made to operate on these input voltages, while many types are available which operate at 28 VDC. This situation has been remedied by MDI by producing a range of 270 VDC and 120 VDC DC-DC Converters that operate directly from the high voltage bus and produce the desired output voltages directly.

Other manufacturers who have a limited product range often suggest a cascade of converters from 270 VDC to 28 VDC (or from 120 VDC to 28 VDC) and then from 28 to the final user voltages. This approach has many drawbacks compared to a single stage of conversion.

- Cascaded converters often have feedback loop stability problems due to the regulating (negative resistance) load that the output converter reflects back to the input converter. These problems are more prevalent when the power levels of both converters are similar. This may result in oscillations.
- Overall conversion efficiency will be at least 15% lower, resulting in increased heat loads.
- MTBF will be reduced to up to 50% because of increased parts count.
- Weight will be increased by an integral factor.
- Unless synchronized, beat frequencies can occur between converters
- Price for a given output will be at least doubled.

MDI's wide range of available 270 VDC and 120 VDC input converters allows the user to generate board level voltages the right way.