



# Efficiency and Space Improvements in Electrical Apparatus

## Efficient and Reliable Electrical Components

A variety of technologies aimed at improving the efficiency of electrical systems are included in the DC Power Conversion Portfolio. Among these are the Compact Power Converter, Simple Pulse-Width Modulator for Matrix Converters and a technology aimed at increasing electric drive output by 50%. When used together, these three technologies can greatly increase the power output and efficiency of electrical devices while taking up less space.

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## DC Power Conversion Portfolio

The method for increasing electrical drive output extends the rated torque capability region to 150% of the rated speed so the power output capability of the machine increases to 150% of the rated amount. When used with the matrix converter for AC-AC conversion control, more power is supplied to allow for pulse-width modulated switching, which simplifies the complexity of the converter matrix and increases the reliability of the converter. Similarly, the small power transformer design has higher efficiency and less complexity than current designs, while reducing the size and number of switches. There is no intermediate DC-conversion step and no capacitor used in this design.

These technologies can greatly reduce cost, size and complexity of electrical systems, while offering more reliable and efficient energy output.

### BENEFITS AND FEATURES OF DC POWER CONVERSION PORTFOLIO:

- Smaller and more reliable than current products
- Able to increase efficiency by almost 50%
- Applications in wind energy, power electronics and hybrid electric vehicles

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