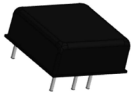


Use case
Eaton high-voltage DC-DC converters



Eaton DC-DC converters provide high-voltage isolation for industrial automation

Industrial automation has exponentially increased the speed, flexibility, accuracy, and volume of production seen in industrial facilities. Equipment such as robotic arms are used to perform tasks that are too arduous, dangerous, or precise to be done manually (e.g., lifting automobile parts in assembly plants). Other applications include robotic vision for precision manufacturing, spot or arc welding, and the loading or unloading of Computer Numerical Control (CNC) machines.

Higher power requirements in industrial automation applications present a dynamic challenge to engineers and designers, who must manage voltage inconsistencies due to large differences in potential

between grounds. For safety reasons and to protect circuits from electromagnetic interference, industrial automation systems must be designed to ensure adequate galvanic isolation between inputs and outputs. Isolated DC-DC converters are often used to provide high-voltage isolation from the main power source to peripheral devices. They achieve this by preventing current flow using transformers.

Due to their small footprints, monolithic isolated DC-DC converters are ideal for minimizing cost and space in many high-volume industrial applications. However, they are not suitable for applications that require isolating the power supply input from the output. On the other hand, isolated DC-DC

converter modules comprising transformers integrated into the converter's substrate are an excellent option for providing electrical isolation. Moreover, isolated DC-DC converters help to prevent ground loops between sections of electronic circuits, thus minimizing electrical noise. Due to harsh operating conditions typical in industrial environments, converters must be able to withstand a wide range of temperatures while ensuring reliable operation.

Eaton Power Module (EPM) isolated DC-DC converters (EPM6, EPM7, and EPM25) provide an excellent balance of performance, flexibility, and cost compared to existing linear regulators and DC-DC converters on the market. They

are offered in either single or double outputs with high voltage isolation from 1 kV to 4 kV for flexible and reliable performance in industrial applications.

Eaton's EPM Isolated DC-DC converters are suitable for isolating primary and secondary circuits and avoiding unwanted EMC or electrical interference. These products offer wide input voltages: 5, 12, and 24 Vdc (EPM6-1V, EPM6-2V, EPM7-1V), 9 to 36 Vdc and 18 to 75 Vdc (EPM25-1V, EPM25-2V). They are packaged in standard SIP4, SIP7 (1 W designs), and through-hole configurations (15 W to 60 W designs). Eaton EPMs can withstand high operating temperatures from -40 °C to +105 °C and meet EN 55032/35 and EN 62368-1/IEC 62368-1 safety standards.

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