VICOR

Case study: Disinfecting robots



Flexible, scalable modular solutions support multiple systems for healthier and cleaner spaces

Customer's challenge

These robots use UV lamps or disinfecting sprays to eliminate dangerous pathogens and bacteria from highly trafficked, large areas such as schools, warehouses, hospitals, and hotels. Typically powered by 24V or higher battery sources, the robots need to power high-intensity UV lights and pumps as well as sensors and motors for autonomous operation. Increasing requirements for safety place increasing requirements on the power delivery network for longer operation and greater capability. The key goals were:

- Highly efficient to extend run time
- Capable of managing high-temperature operations
- Supporting a variety of point-of-load voltages

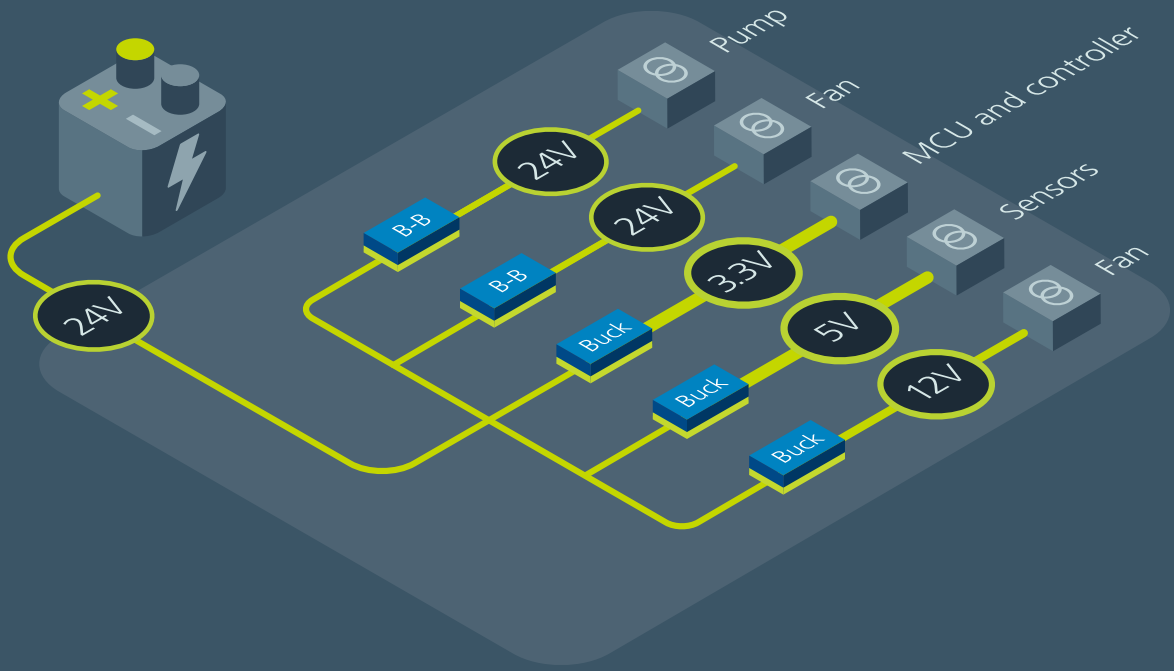
The Vicor solution

Disinfection robots use technologies such as ultraviolet light, electrostatic spraying, and other sensors and navigation systems to sanitize environments and move autonomously through work spaces. Vicor high-power density and high-efficiency power modules allows to support a wide range of loads and significantly reduce space and weight for a more efficient robot. Key benefits were:

- Compact high-density power modules optimize available design space
- Power modules support a variety of input voltages for PoL devices
- High efficiency

The Power Delivery Network

Vicor ZVS buck and buck-boost regulators provide efficient, lightweight, and compact regulation to support a wide range of loads. This design shows the battery's 24V being regulated to drive pumps, fans, sensors, and controllers ranging from 3.3V to 24V. The Vicor modular approach to PDNs results in high-efficiency (>95%) and less space required compared to traditional DC-DC converters and regulators handling high power requirements.





ZVS buck regulator

Non-isolated regulated

Input:12V (8 – 18V),
24V (8 – 42V), 48V (30 – 60V)

Output: 2.2 – 16V

Current: Up to 22A

Peak efficiency: 98%

As small as
10.0 x 10.0 x 2.56mm

vicorpower.com/buck



ZVS buck-boost regulator

Non-isolated regulated

Input: 8 – 60V

Output: 10 – 54V

Power: Up to 150W continuous

Peak efficiency: 97%

10 x 14 x 2.56mm

vicorpower.com/buck-boost

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