Revolutionary Micro Disc Pump Technology Replaces Mechanical Operation

Cambridge-based TTP has invented a revolutionary new miniature gas pump that replaces traditional mechanical operation with ultrasonic pressure generation technology to deliver greatly reduced size and silent running. The innovative, patented micro Disc Pump has already been commercialized in a wound therapy application and is ideally suited to other portable medical applications such as blood pressure measurement, as well as micro-fluidic and industrial applications where size, noise and controllability are important design factors.

Disc Pump’s ultra-slim design is achieved by using a piezoelectric actuator to drive pressure oscillations in a thin disc shaped cavity: one current model measures just 4mm in thickness. Silent operation is achieved by running the pump at frequencies above the limit of hearing, using special custom, high-speed valves to rectify the pressure oscillations.

The combination of pressure generation technology and high frequency operation make it possible to deliver pneumatic performance significantly higher than traditional pumps of comparable size. With a wide dynamic range, the TTP technology has already achieved stall pressures in excess of 600 mbar and flow rates of more than 2,500 cc/min. The high-frequency piezoelectric mechanism provides virtually ripple-free output compared to the pulsed output that characterizes most conventional pumps.

“We see a growing trend towards miniaturization, portability and discrete operation in markets such as medical devices, diagnostics and electronics driving demand for small, silent, high-performance pumps,” said James McCrone head of the group at TTP responsible for micro-devices. “Responding to this need with an entirely new technology is very exciting as the market is currently dominated by pumps based on mechanical principles dating back over 100 years.”

TTP has already developed a range of designs tailoring performance to specific applications. “We are working with development partners and licensees to take the technology into both existing and new markets. The benefits of Disc Pump – backed up by our strong portfolio of patents – help our partners to build a solid market position,” says McCrone.

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