



Smart Hydraulic Pump

Freeing Up the Space to Go Smart



Small Size,
Low Profile



Low
Noise



Reduced Time
to Market

The Customer's Challenge

Hydraulic pump manufacturers are taking advantage of smart technologies to improve their systems by reducing energy consumption, improving predictive maintenance, increasing flexibility, and maximizing machine uptime and productivity.

Vicor recently helped one pump manufacturer looking to exploit the opportunities that existed in this fast developing market. Finding a way of powering the smart control upgrade to an existing hydraulic pump was proving to be a real challenge for the design team, mechanically and electronically. The first challenge was to find a way of fitting both the new power control and power supply within the existing casing. The design team was concerned that the resultant restricted space would complicate the ability to remove wasted heat. At the same time they needed to ensure that their solution exhibited low output ripple to maximize the system's performance. All while trying to get their solution onto the market quickly.



The Solution

A single DCM DC-DC converter was used to step down the high voltage DC input to provide the 12V needed by the motor and controller. This provided the isolation necessary to reduce the output ripple and improve the accuracy of the measuring system.

[Link to Whiteboard »](#)



The Results

The high power density of the DCM (almost 400W delivered in a package measuring just 37 x 23 x 9mm) enabled the easy integration of the power into the existing space-constrained case. The DCM's high efficiency reduced wasted heat, and the unique double-sided cooling capabilities of the ChiP packaging enabled conduction cooling. The efficient heat removal helped improve the reliability of the system, and lengthened its life.

The use of off-the-shelf components minimized the design effort required, therefore reducing time-to-market, at the same time as meeting all their design goals.

Product Family Key Specifications

DCM DC-DC Converter Module

Input Voltages	9 – 50V _{DC} 16 – 50V _{DC} 18 – 36V _{DC} 36 – 75V _{DC} 120 – 420V _{DC} 160 – 420V _{DC} 200 – 420V _{DC}
Output Voltages	3.3, 5, 12, 13.8, 15, 24, 28, 36, 48V
Output Power	4623 ChiP: Up to 600W 3623 ChiP: Up to 320W
Efficiency	Up to 93%
Dimensions	4623 ChiP: 47.91 x 22.8 x 7.21mm 3623 ChiP: 38.72 x 22.8 x 7.21mm