

CASESTUDY

BCI-motors
Medical technology
November 2008

Compact small drives improve surgeon's view New flushing pump for medical endoscopy

Modern small drives are robust, reliable and feature high power density. They enable solutions that, until recently, had been inconceivable. Many applications in today's medical technology field require compact motors with quiet gearboxes



Technical data

During endoscopic treatment, the doctor must have a clear view of the target area for the procedure. Therefore, a compact flushing pump with clear detergent and continuous flow of liquid ensure good visibility. An easily adjustable (peristaltic) hose pump conveys the clear fluid by hose movement. A 24 V brush motor (diameter 42 mm, length 89 mm) with 18.5 W (57 mNm) of continuous output at 3100 rpm and compact plastic gearbox (length 38 mm) moves the pump impeller.

With a gear reduction of $i=6.75:1$, the motor speed is lowered while, at the same time, the drive torque is increased to attain the optimum adjustment to the design of the pump. During this process, the gearbox output shaft readily absorbs the radial loads that occur on the pump impeller. A PWM control enables highly sensitive flow rate adjustment of up to 500 ml/min, depending on the application. The use of high-quality plastic gearing parts means that the maintenance-free, very smooth-running and durable drive unit operates with high efficiency while also having a cost-optimized design. The integrated interference suppression means that the drive conforms to the stringent EMC requirements for medical devices.