

## Is the displacement controlled non-symmetrical actuator technology industrially accessible?

Most industrial applications of hydraulics are based on pressure controlled circuits. The reason of that is the unavailability in the past of the needed technologies for alternatives schemes, the high cost of electronic equipments, the small importance of energy efficiency of systems.

Nowadays energy issues have become a central point of interest and technology barriers have fallen.

In terms of energy efficiency, displacement controls are advantageous, because, in their case, no intentional losses are produced within the power circuit. In the displacement control with impressed volume flow the pump only generates that fraction of power output which is requested by consumer.

As a pump delivering a variable volume flow, the constant displacement pump with variable speed is sometimes used today. It is driven by an alternating current motor fed by a frequency-controlled converter. When powered by ad AC servo drive these pump systems fulfill the demanding static and dynamic requirements, but at a price noticeably higher then that of a variable pump driven by a motor with constant speed.

The realization of displacement control is uncomplicated for rotary actuators and linear actuators with double rod cylinders. Several industrial application have been developed during the last time.

However the kinematics and the whole machine design of manipulators requires very often the use of differential cylinders. The unequal areas of the differential cylinder have to be compensated if the differential cylinder may run within a pump controlled actuator in a closed hydraulic circuit.

Different circuit solutions allowing the compensation of the unequal cylinder areas were developed in the recent past.

All these solutions are somehow complex and tailored around variable displacement pumps and central power unit (i.e. diesel engine) and sometimes hardly applicable for common industrial applications.

The development of a simple, cheap and reliable solution will spin the use in the common industrial applications of displacement controlled non-symmetric actuators allowing compact and energy efficient systems, and leading the way to several new applications as the power by wire technique.

**Inova, has developed a proprietary patented technology that achieves a simple and cheap solution to the quoted problem.**

**The technology allow to simply power and control a non-symmetrical actuator with a displacement based circuit.**

### The company

**Inova is a consulting company for the technology and technical product innovation.**

**We identify and suggest to our customers new area of product development and improvement.**

**Inova can bring innovative engineering design solutions thanks to its multi-sector and multi-discipline experience.**

**We bring the 'lateral vision' that can generate the real innovation opportunity.**

**Inova develop and suggest proprietary solutions and technologies, based on which it can generate the product innovation of its customers.**