



Fig. 1 - Vector inverter drives

## “Energy saving” electrohydraulics suitable solutions for modern machinery

Energy efficiency improvement, mandatory requirement for modern machinery, has led to the development of new “energy saving” hydraulic solutions consisting of fixed displacement hydraulic pumps driven by an electric motor + inverter (Fig. 1) . The motor speed control allows to adapt the pump flow rates to actual system’s needs, thus reducing the overall power consumption.

This new solution is alternative to the running one realized with axial piston servopumps coupled to standard electric motor and equipped with on-board digital P/Q control for proportional regulation of both flow and pressure (Fig. 2).

Atos systems division - carried out R&D trials to check “Pro & Con” of the inverter Vs servopump, in order to provide a guideline for the suitable solution:

- the response time of inverter solutions is 2 ÷ 5 times higher than digital servopumps
- reduced accuracy and repeatability (+/- 3%) respect servopumps (+/- 0,5%)
- servo drive systems perform better energy saving, about 10%, with an average investment's pay-back period of minimum 24 months
- inverter solutions require an additional proportional valves for pressure control
- electrohydraulic systems have easier maintainability and competitive prices.

“High dynamics” closed loop servomotors, with integral rotative position transducer and inverter, allow to improve dynamics and accuracy but they are quite expensive (Fig. 3).

To improve energy saving in electrohydraulic systems, the variable displacement pump can be undersized and coupled with accumulator groups which supply the required peaks of power. This solution is topical for hydraulics multiaxis machines.

In conclusion, it is not possible to fix a general purpose solution, in fact the best one has to be defined in relation to the specific characteristics of each machine and application.

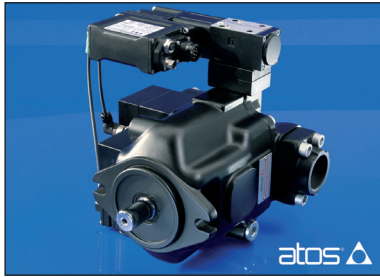
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Fig. 2 - P/Q digital servopump



Fig. 3 - Asynchronous motor + inverter



P/Q digital servopump

## “Energy saving” electrohydraulics

Energy efficiency improvement in modern machinery boosted the development of “energy saving” hydraulic solutions consisting of fixed displacement pumps driven by an electric motor + inverter in alternative to the traditional system with asynchronous motor coupled to variable servopump with on-board digital P/Q control.

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- reduced accuracy and repeatability (+/- 3%) respect servopumps (+/- 0,5%)
- servomotor systems perform better energy saving, about 10%, with 24 months average investment's pay-back
- inverter solutions require an additional proportional valves for pressure control
- electrohydraulic systems have easier maintainability and competitive prices.

It is not possible to establish a general purpose solution but only the best one in relation to the specific characteristics of each machine and application.

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