Energy Efficiency
Executive Summary

Regulate flow rate more efficiently

Build it in.

Flow rate control is used in many applications. Notable examples include use of hydraulic technologies for cylinder (linear actuator) and motor (rotary application) speed and position control in numerous industrial application including presses, machine tools, injection molding machines. Electrical and mechanical components such as drives, pumps and valves are typically combined in order to implement such control tasks in fluid-power applications. The question of which elements are used, and how they are integrated into the system, has a decisive influence on the energy consumption of the overall solution. In the white paper, "Planning and operating hydraulic power units to provide greater energy efficiency", Marco Bison, Manager of Mechatronic Technologies, explains the reasons for, and approaches to, reducing energy consumption, and presents practical application examples.

The overwhelming majority of hydraulic power units currently in use are operated by a motor and pump running at a constant speed. Implementation in this way has been tried and tested and is widely accepted by the market. However, high energy costs always lead (among other issues) to this solution performing worse in terms of total cost of ownership (TCO) in comparison to a consumption-oriented solution based on the 'power on demand' concept that uses a variable speed drive.

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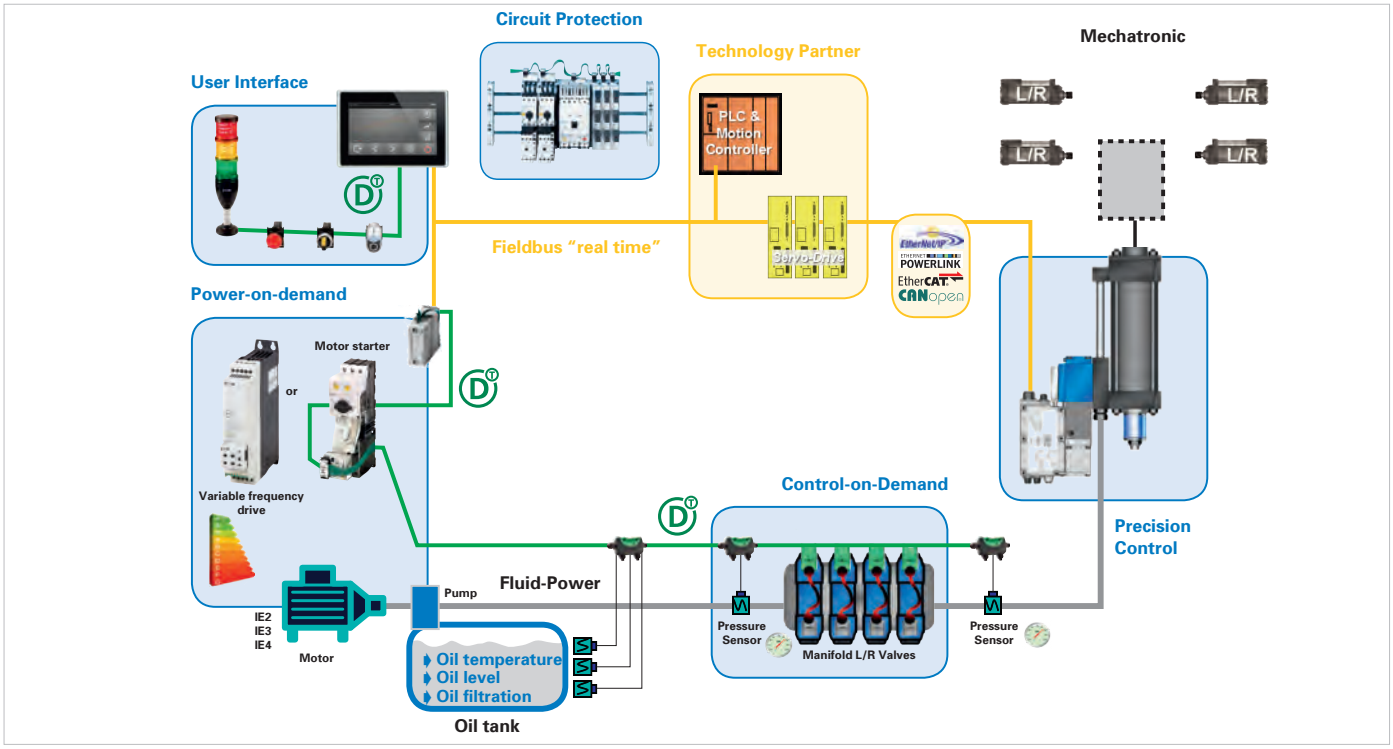

In addition lowering the energy costs, the reduced filter costs, smaller oil tank and shorter commissioning times when implementing a variable speed driven solution also have a positive effect. Other benefits include more robust operation, due to its lower susceptibility to oil contamination. With only a slightly larger investment, variable speed pump drives quickly enable high energy savings in hydraulic power units. Typically, a reduction in energy consumption of up to 70 percent can be achieved.

Given the lower levels of generated heat and the reduced wear of components and oil consumption, the availability and reliability of your machines and systems also increases. In addition, if the solution is implemented at device level with an intelligent wiring and communication system, this not only reduces development and commissioning times, but also facilitates the integration of the machine into the Industry 4.0 architecture.

Together with its lean solution partners, Eaton offers complete electro-hydraulic solutions for simpler, more compact and more cost-effective machines. Our network of partners includes specialists in electrical, hydraulic and pump applications who provide comprehensive service, from selecting the right components and developing the best solution to implementation and after-sales services.

Would you like more information? Read the white paper in full at: www.eaton.eu/moem-ee

Demonstration of a real electro-hydraulic machine

In cooperation with the solution partner ATP Hydraulik, a machine model has been developed which consists of three electro-hydraulic systems operating in parallel. Several control and drive variants carry out defined vertical stroke movements, with a maximum load of 600 kg. The three independent machines not only communicate with one another (M2M), but the data can also be made available anywhere and at any time, e.g. through a cloud service. All data can be visualised, enabling a direct comparison of the three systems in terms of dynamics, energy consumption and total cost of ownership. Machine downtime, pressure holding times and partial load operation may also be simulated and evaluated. Such cases are frequently encountered in machines used for pressure casting, pressing, and the production of plastics and tools.

With a "Power-On-Demand" drive solution, you can achieve:

- Scalability of the solution (costs vs. functionality vs. performance)
- Improved efficiency (power management)
- Enhanced profitability (reduction of operating costs)
- Precise repeatability in the long term (precision control)
- Improved spatial conditions (smaller oil tank)

ATP HYDRAULIK

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