

Fig. 1 - Blow molding presses

Digital Electrohydraulics for Plastics “smart” systems with P/Q controls & servocylinders

New electrohydraulics solutions for plastic machinery realize strong improvements of axis motion performances in terms of controls flexibility, higher dynamics & accuracy for speed, position and pressure regulations (Fig.1).

Atos system division, has designed specific driving systems consisting of “smart” power packs providing energy saving, low noise emissions and high dynamic motion cycles thanks to modern servoproportional valves with on board digital electronics for precise combined P/Q axis controls.

They makes possible an easy integration in the modern machine automation, thanks to sophisticated algorithms and fieldbus communication interfaces, including EtherCAT and POWERLINK fieldbus based on Ethernet technology featured by high performance in terms of cycle time; clock accuracy and enhanced diagnostics to reduce unplanned downtime to a minimum.

A broad spectrum of digital servoproportionals represents the digital electrohydraulics solution for motion control of injection and mould axes, bringing considerable advantages to injection and molding processes such as high productivity; repetitive quality and accurate tolerances of final molten products.

- **injection process** - accurate dynamic pressure regulations are controlled by digital proportional valves with specific spool cut to operate all the injection phases. The digital P/Q driver, coupled with an external pressure transducer, provides the high dynamic and repeatable transition from the injection to the holding and back pressure controls

High dynamics servoproportionals available up to size 35 (size 32 with 50 mm ports diameters) are able to handle a max flow rate of 1.200 lpm @ $\Delta P= 5$ bar, single path (Fig. 2)

- **high speed injection** - new plastic compounds and thin-wall pieces require high injection speed performed by presses with accumulators. The wide range of 2 or 3-way proportional servocartridges handle flows up to 10.000 l/min with low pressure drops (< 25 bar) and fast response time (< $15 \div 20$ ms).

- **mould control** - ISO 6020-2 servocylinders with magnetostrictive transducer, low friction seals and reinforced cushioned heads (Fig. 3) are actuated by proportional valves with regenerative special spool cut that improves the mould braking effect and repeatability required by robots assisted presses.

In addition the digital P/Q valves perform the “mould safe function” with low pressure regulation during the mould final approach (Fig. 4).

The power packs are designed with servopiston pumps equipped with on board closed loop digital regulation of pressure and flow; the limitation of max power consumption is selectable by software to reduce energy consumption and at the same time lower noise emissions (Fig.4).

The assisted accumulators presses for high speed injection are equipped with internal gear pumps (up to 250 cm³ at 280 bar) and electric motors driven by inverters for variable speed pump regulation.

They are certified CE/PED according to European Directive 2014/68/UE PED and supplied with installation, commissioning and maintenance handbook.

All hydraulic units are designed according to CE norms to prevent injuries according to the Machine Directive (2006/42/CE) and they use monitored safety valves, TÜV certified

For further information look at www.atos.com



Fig. 2 - size 35 servoproportional



Fig. 3 - ISO 6020-2 servocylinder

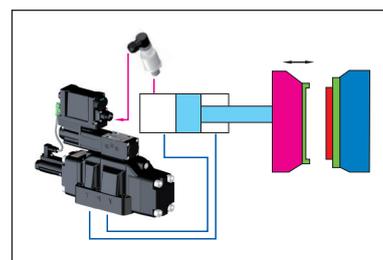


Fig. 4 - P/Q control by servoproportional



Fig. 5 - “smart” power pack



size 35 servoproportional

Digital Electrohydraulics for Plastics

Energy savings and digital electrohydraulics with fieldbus interfaces based on Ethernet technology are the leading solutions for motion control in advanced plastic machinery. Atos has developed specific components and driving systems to fulfill control flexibility, high dynamics and repetitive molten parts quality:

- **Injection process** - servoproportionals up to size 35 (size 32 with 50 mm diameter ports) with specific spools and on board electronics for combined P/Q axis control
- **High speed injection** - 2 or 3 - way digital servocartridges with flow up to 10.000 l/min for thin-wall products
- **Mould control** - proportionals with regenerative spools and on board Speed/Force controllers for "mould safe function"
- **ISO 6020-2 servocylinders** with built-in magnetostrictive transducers and low friction seals for mould/ejector axes
- **Power pack** - with digital servopistons pump for P/Q closed loop regulation or with internal gear pumps + inverters

Atos hydraulic components are CE/PED certified according to European Directive 2014/68/UE PED; monitored safety valves are TÜV certified to CE safety norms as per Machine Directive (2006/42/CE).

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