



Prefabricated control cabinet from Siemens



SINAMICS S120

The PSH system in new machines and retrofits

Features of the PSH	The advantages in the press drive
<ul style="list-style-type: none"> • No throttling losses of control valves • Active closed-loop control of the servo pump 	<ul style="list-style-type: none"> • High energy efficiency: Energy usage slashed by up to 60 % • High efficiency
<ul style="list-style-type: none"> • Modular design • Few components 	<ul style="list-style-type: none"> • Simple drive system with a high degree of functionality • Lower complexity • Simple system integration • Simple preventive maintenance
<ul style="list-style-type: none"> • Closed-loop force/velocity/position control using the servo pump 	<ul style="list-style-type: none"> • Valve systems can be eliminated • Optimum adaptation of force and velocity to the press process • Precise reproducibility of velocity, force and cycle rate
<ul style="list-style-type: none"> • Extremely good thermal balance 	<ul style="list-style-type: none"> • Small oil tank
<ul style="list-style-type: none"> • Sensors to monitor the various parameters 	<ul style="list-style-type: none"> • High degree of diagnostic capability

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This QR code leads you straight to the SINAMICS servo pump video!



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SIEMENS



Simple, efficient, quiet and energy-saving

Pressdrive Servo Hybrid press from Voith Turbo H + L Hydraulic GmbH & Co. KG

Solutions with SINAMICS servo pump

[siemens.com/servo-pump](https://www.siemens.com/servo-pump)

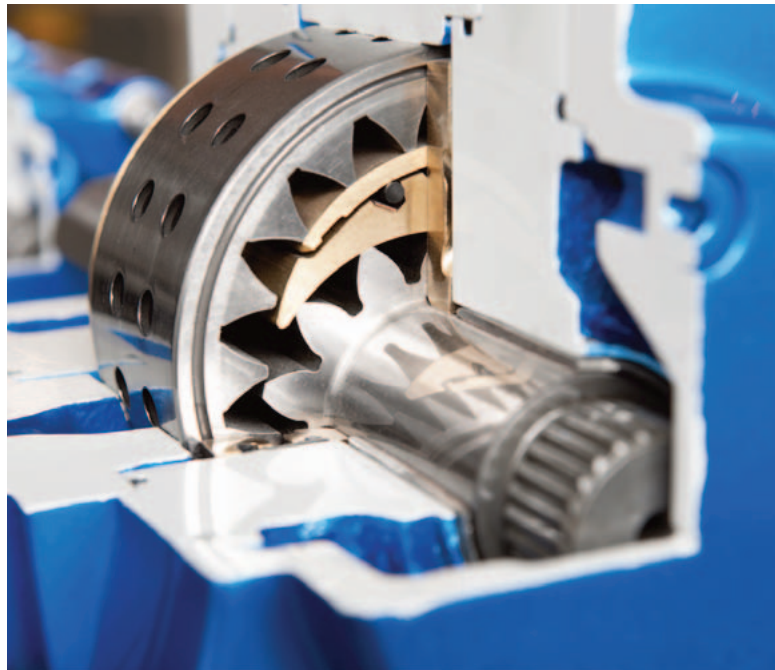


"PSH", the new servo-hydraulic press in an endurance test in Rutesheim

As a result of resources that are becoming scarcer and scarcer, the topic of energy efficiency is also becoming more important for the machine building industry. The new servo-hydraulic "PSH" press from Voith is an important step in this direction, allowing energy consumption to be slashed by up to 60% – for new systems as well as retrofits.

What each company would most likely have never created alone, two companies leading in their particular sectors were jointly successful in just a short time: Voith Turbo H + L Hydraulic GmbH & Co. KG and Siemens merged their know-how and created an innovative servo-hydraulic drive for presses ready for series production. The result is called PSH (Pressdrive Servo Hybrid), which slashes the energy consumption by up to 60 % with respect to comparable conventional drive systems.

The Voith company from Rutesheim, Germany, can certainly still be considered a pioneer in the area of energy-saving servo-hydraulic presses: Voith is seen as a well proven supplier of hydraulic components and as solid and consistent innovation leader in the hydraulic sector. A company that not only develops products but also ideas. Siemens is a manufacturer and supplier of innovative products and solutions, for example, energy-efficient servomotors.



Cross-sectional view of an IPVP internal gear pump from Voith

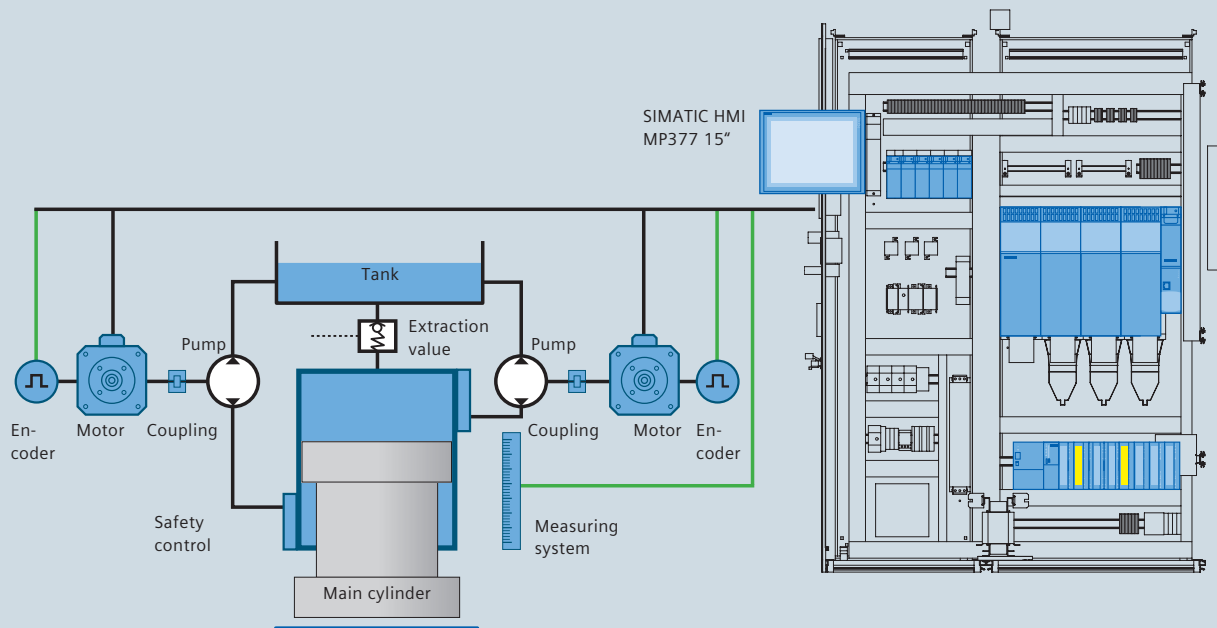
In close collaboration, an optimal product combination was specified for the "PSH" series. This combination comprises an internal gear pump from the Voith IPVP series, partnered with globally available standard Siemens components, especially the water-cooled SIMOTICS M-1PH8 servomotor, which has an optimum energy efficiency.

The complete system for the servo-hydraulic press is supplemented by a hydraulic unit, servo pumps, safety technology, switching electronics and sensors. It also includes a controller, I/O and operator panel with preconfigured touch user interface.

The hydraulic press drive represents a real innovation!

Modularity creates flexibility

Joint challenge when developing the PSH systems: Implement the hydraulic, process-related tasks, and, at the same time, comply with the requirements involving high performance and create a control and drive system that is simple to handle and control. With this objective in mind, Siemens experts selected the fail-safe SIMATIC S7-317TF CPU. In addition to demanding technological and hydraulic functions, this CPU also integrates extensive safety functions. The modular design and the simple basic concept of the press drive allows the press force to be simply increased. This eliminates an additional safety control along with the associated wiring and installation costs. The SINAMICS S120 drive system has a modular structure,



Hydraulic diagram and overall structure of the PSH Voith automation solution, including SINAMICS S120 drive system, SIMATIC S7 317TF and PSH technology

which allows it to be precisely adapted to individual requirements.

The classic valve technology has almost been completely eliminated – it has only been kept in the safety-relevant modules. Further, the circulating oil volume was drastically reduced as the central, continually operating pump drive was eliminated, together with the associated energy that it consumed.

The certified press safety blocks are integrated as software for functions such as two-hand operation, operating mode selection, protective door, acknowledgment button and Emergency Stop/Emergency Off.

As a consequence, the supplementary library for the safety package Distributed Safety comprehensively addresses all requirements. The function blocks are certified according to EN ISO 13849-1 (up to performance level e), EN 954-1 (up to Category 4), EN 61508 and EN 62061 (up to SIL3). The press-specific standards EN 692, EN 693, EN 12622 and EN 13736 were applied.

The comprehensive portfolio also for modernization

Not only this, the new drive solution generally requires significantly less space than older hydraulic systems; this makes it predestined for modernizing systems (retrofits). The state-of-the-art sensor system provides additional diagnostic capabilities, which supports preventive maintenance and, in the ideal case, condition-oriented maintenance. An additional advantage: The PSH drive from Voith Turbo and Siemens is significantly quieter.

Energy use in line with the process

Generally, the energy-efficient, modernized systems use only as much energy as the presses require in the various phases. The biggest energy-saving impact is in the non-operational times: The servo-driven pump is then essentially at a standstill and only requires very little energy, while pumps used in the previous solutions had to continue to operate with a lower power (15 – 20 %).

Highest availability and productivity

The use of well proven standard components that are available around the globe and around the clock permits fast and simple access to replacement parts – and, as a consequence, secures the high availability and productivity of the presses.

Hardware and software for the complete monitoring, open-loop and closed-control of the PSH system

Components used:

- Voith IPVP internal gear pump
- SIMOTICS M-1PH8 synchronous servomotor
- SINAMICS S120 Booksize drive system
- SINAMICS CU320
- SIMATIC S7-317TF
- Prefabricated control cabinet
- Complete sensor system