

Voith Turbo H + L Hydraulic GmbH & Co. KG, Germany

Know-how merger for efficient press drives



Two pumps driven by servomotors supply the precise amount of oil required for the process – that is the concept of the electrohydraulic Pressdrive Servo Hybrid (PSH) hybrid drive, which reduces power consumption by up to 60%. We spoke to the head of sales and marketing at Voith Turbo H + L Hydraulic, Harald Branz, and Ingo Geier from Siemens about this innovative development resulting from a technology transfer between the two companies.

Mr. Branz, compared with similar drive systems, the PSH system significantly reduces power consumption. How did you achieve that?

Harald Branz: The key factor is the use of the right Siemens drive technology. We use servomotors from the Simotics M-1PH8 series and converters from the modular Sinamics S120 line for the direct drive of two internal gear pumps that are regulated according to the exact requirements of the press process. Two compact units consisting of a pump and servomotor supply variable volume flows, thus precisely regulating the up and down movements of the main cylinder and the slide of the press. This makes the usual valve technology unnecessary in most cases. Another factor is that there is no longer a central, continuously working pump drive, and the circulating oil volume has been drastically diminished. This usually eliminates the need for cooling, and the oil does not thermally age as quickly anymore and therefore does not need to be replaced as frequently. This significantly reduces costs over the lifecycle of the press.

What were the challenges during the development of the PSH system that Siemens and Voith had to overcome together?

Optimized system: the new press with an innovative PSH drive was developed jointly by Voith and Siemens

Ingo Geier: We had to implement the hydraulic and process-related requirements on a powerful yet at the same time easy-to-operate control and drive system. For this, we selected a fail-safe Simatic S7-317TF technology CPU, thus dispensing with an additional safety control system. And the modular Sinamics S120 drive system connected via Profibus with the control system can be precisely adjusted to Voith's specific requirements. All the drive components are interconnected via the digital Drive-Cliq system bus, and the motors are automatically detected by their electronic nameplate. The modular set-up and the simple basic concept of the press drive make increasing the press force easy – pump/motor units are simply added. Since hydraulic presses with the PSH drive can always be set up the same way, maintenance and spare parts management are also simplified.

Is this technology still easy to operate for the user?

Ingo Geier: Absolutely. A Simatic MP377 Multi Panel with a 15" touch display is installed at the switch cabinet for convenient control and monitoring. An easy-to-understand operator interface using Simatic WinCC flexible guides the operator through the process and visualizes all the relevant parameters. Remote access is also possible.

Are there other benefits that distinguish the PSH solution from conventional systems?

Harald Branz: Press force and slide speed are regulated directly through the speed of the pump motors, and the actual values are transmitted back to the technology CPU via the pressure and displacement sensors. The control system detects deviations from the target values and dynamically and precisely equalizes them with the Sinamics Control Unit. Force, speed, and paths can be adapted to different press processes. Path profiles that can be exactly reproduced even for high numbers of cycles also guarantee a consistently high product quality.

Safety is also very important for presses.

How do you ensure it?

Ingo Geier: The additional library for the Distributed Safety package covers all the requirements with certified press safety blocks. The communication between the control system and the distributed I/O system using the Simatic ET 200S program in both standard and safety-oriented versions takes place via Profibus, the Profisafe profile, and locally via the Profibus cable.

Mr. Branz, despite all the innovation, the PSH system still works with proven standard components. What are the advantages of this?

Harald Branz: The use of standard components that are available around the clock and around the world is extremely important for an internationally oriented company such as Voith, because it ensures

“To achieve low energy consumption, we use servomotors and converters from Siemens in our direct drive of two internal gear pumps that are regulated according to the precise requirements of the press process.”

Harald Branz, Head of Sales and Marketing,
Voith Turbo H + L Hydraulic

Voith Turbo H + L Hydraulic



“Together, we were able to implement the requirements on a powerful yet at the same time easy-to-operate control and drive system.”

Ingo Geier, Sales/Marketing Engineer for
Plastics and Rubber Machinery, Motion Control
Systems, Siemens AG

Siemens AG



that spare parts are available globally at any time and thus guarantees the high availability and productivity of the presses. Also, the new drive solution usually requires significantly less space than older hydraulic systems, making it suitable for modernization measures as well.

Mr. Branz, Mr. Geier, thank you very much for speaking with us.

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