

# Variable speed pump drives Servo pump



# Innovative technology

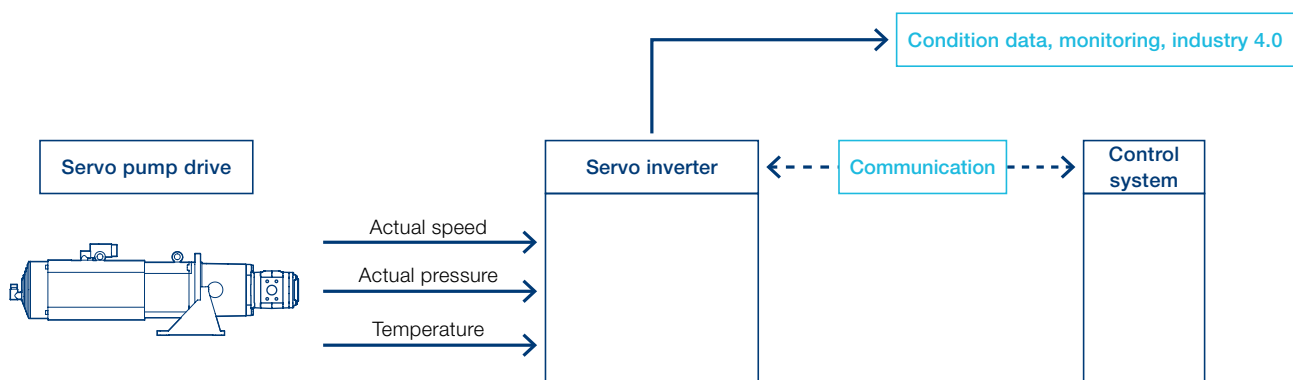
## Industry 4.0 ready

The measurement and recording of up-to-date information by the servo inverter, based on the status of individual components and system diagnostics, facilitates easy integration within the framework of Industry 4.0.

Our components record, control and transmit the most diverse operating parameters such as pressure, acceleration and temperature. Also within the scope of condition monitoring, we have the potential to measure and record data such as oil levels, filter state, component and system efficiency. The hub, the servo inverter, connects to a higher-level control system and enables data exchange and the integration of the unit.

An intelligent Voith servo pump drives signal, under load, any wear-related efficiency loss detected in the system. The higher-level control system receives this data, facilitating maintenance planning and scheduling at an early stage and effectively preventing machine and plant downtime. As a result, on-site service requirements can also be reduced by as much as 70%.

### System integration



# Innovative hydraulics

## Variable speed pump drives

Unprecedented functionality is achieved within your hydraulic system when installing our variable speed pump drives. Compared to other hydraulic systems utilizing classic valve technology, energy savings of up to 70% can be achieved. This saving stems from the reduced cooling capacity and the reduced fluid volume. Additionally, noise emission is reduced by up to 20 db(A) in most applications.

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### Technical data

Maximum power per drive	250 kW
Maximum volume flow per pump	625 l/min
Maximum accuracy of pressure control	$\pm 1$ bar
Maximum operating pressure	345 bar

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Servo pump drives control the pressure or the volume flow, converting electrical energy into hydraulic energy, which is needed in the hydraulic system. The use of classic valve technology within the system can be either partially or completely omitted. If omitted, it simplifies the hydraulic system considerably.

Our specialists ensure you have a customized, ready-to-run variable speed pump system, all from a single source. Utilizing the cycle data from your machine or system, we determine the required pressures and volume flows. The pump system is then designed based on this information.

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### Servopump



### Properties

- Radial and axial gap internal gear pump compensation
- Volume flow control for speed or position
- Pressure control for force
- Volume flow and pressure control possible
- Usual field bus
- Monitoring

### Applications

- Plastics machinery
- Die-casting machines
- Presses
- Machine tools
- Metallurgy
- Woodworking machinery
- Paper machines

# Advantages and benefits at a glance

Features	Advantages	Benefits
Reduced pump speed in the part load range and outside the machine cycle	Up to 70% potential energy savings in hydraulic systems	+ <b>With considerably lower energy costs, you reduce the total cost of ownership (TCO) for your machine or system</b>
	Noise emissions are reduced by up to 20 dB(A)	+ <b>Reduced cost and effort for noise abatement; workplace costs guidelines can often be met without the need for additional measures</b>
Integrated process monitoring	The drive system has its own diagnostics and is Industry 4.0 ready	+ <b>Maintenance needs can be detected early and extremely quickly</b> + <b>Downtime of the machine or plant is considerably less</b> + <b>On-site service calls can be reduced by up to 70%</b>
Volume-flow or pressure control directly via the pump system – not using valves	Hydraulic power loss in the system is lower	+ <b>Your cooling system is simpler, saving you investment costs</b>
	The level of heat introduced into the hydraulic system is lower	+ <b>Lower cooling power results in lower operating costs</b> + <b>Components have a longer service life</b> + <b>Reduced oil management costs thanks to lower load on the pressure fluid</b>
Controlling the system requires fewer classic valves or none at all	The system is less complex	+ <b>Your hydraulic system has a characteristically high reliability and availability</b> + <b>The productivity of your machine or system is high</b>
Highly dynamic control using servo pumps. Low mass moment of inertia of the internal gear pump	Actuator cycle times can be shortened by up to 50%	+ <b>The productivity of your machine or system improves considerably</b>
Control parameters of the servo pump integrated into the servo inverter	Voith servo pumps are delivered ready to go	+ <b>This reduces the development times and costs associated with your machine or system</b> + <b>Integration into existing control concepts is easy</b> + <b>Our servo pump systems are ideal for retrofit solutions</b>

# A wide range for optimal solutions

## Designs

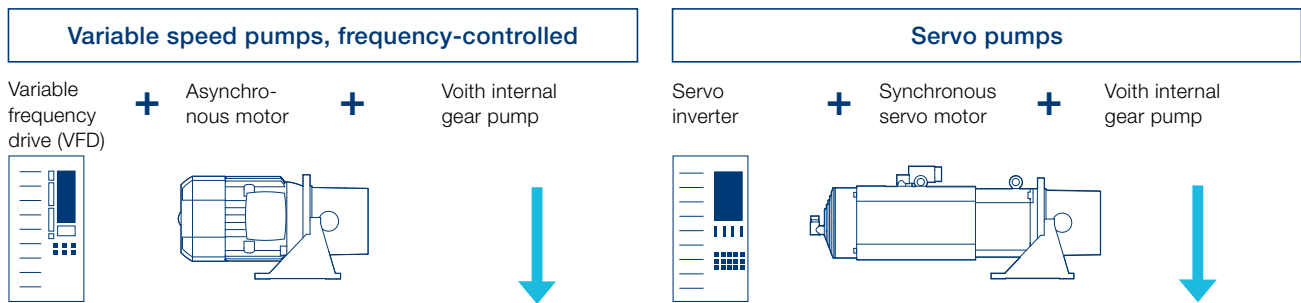
Variable speed pumps in their simplest form are frequency controlled and consist of three main components:

1. Variable frequency drive (VFD)
2. Asynchronous motor
3. Voith internal gear pump

Should your hydraulic system have high control engineered requirements, servo pump drives are the ideal solution. In their basic form, these pump drives consist of three main components:

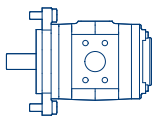
1. Servo converter
2. Synchronous servo motor
3. Voith internal gear pump

## Possible combinations

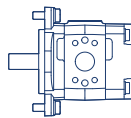


## Voith internal gear pumps (single pumps or pump combinations)

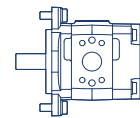
IPS  
(High pressure up to 345 bar)



IPVAP  
(High pressure up to 320 bar)



IPCAP  
(Medium pressure up to 250 bar)



# An impressive comparison

Conventional hydraulic systems usually have constant volume flows. As a result, these systems have virtually constant energy consumption.

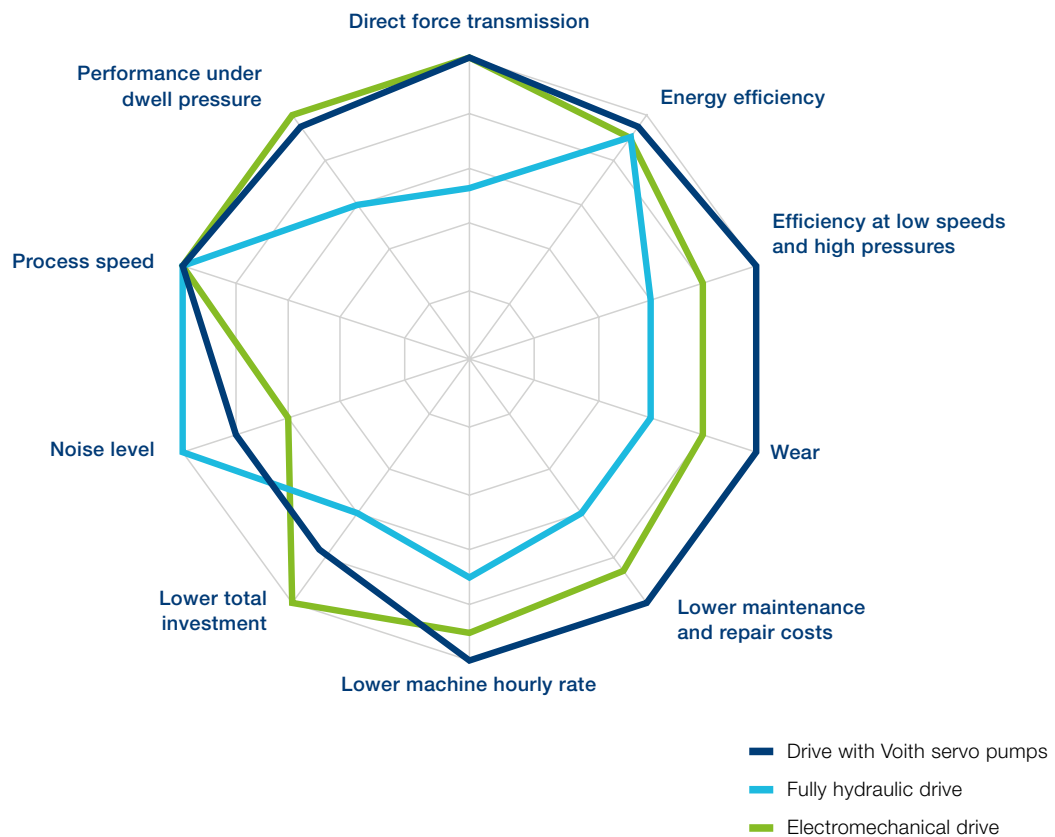
Using servo pumps makes it possible to vary the volume flows in hydraulic systems. In the part load range and outside the machine cycle, the servo pumps operate at lower speeds or stop altogether. Servo pumps reduce the energy consumption by up to 70%.

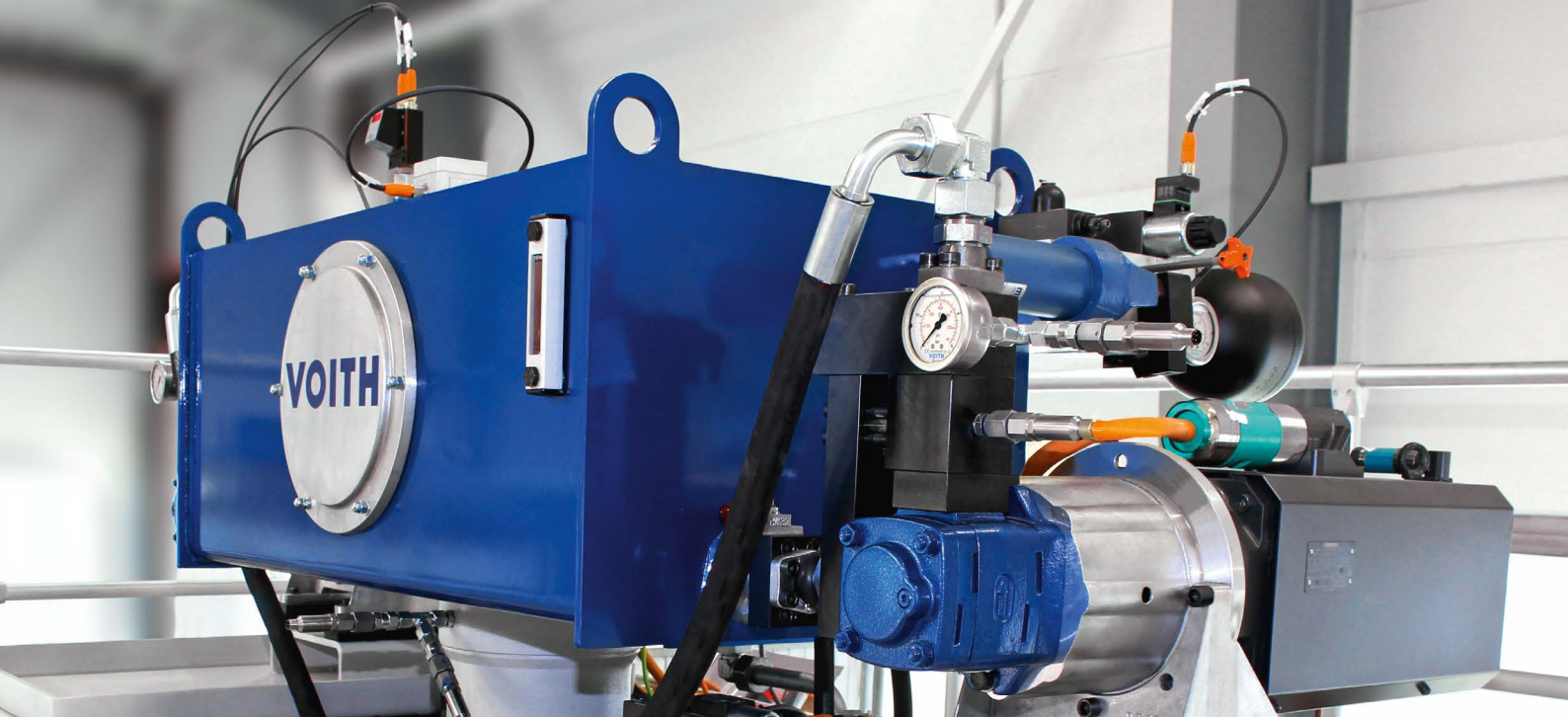
Servo pump drives also reduce the hydraulic system total cost of ownership (TCO) by up to 35%.

Lastly, amortization of the servo pump drive is usually achieved within one to two years.

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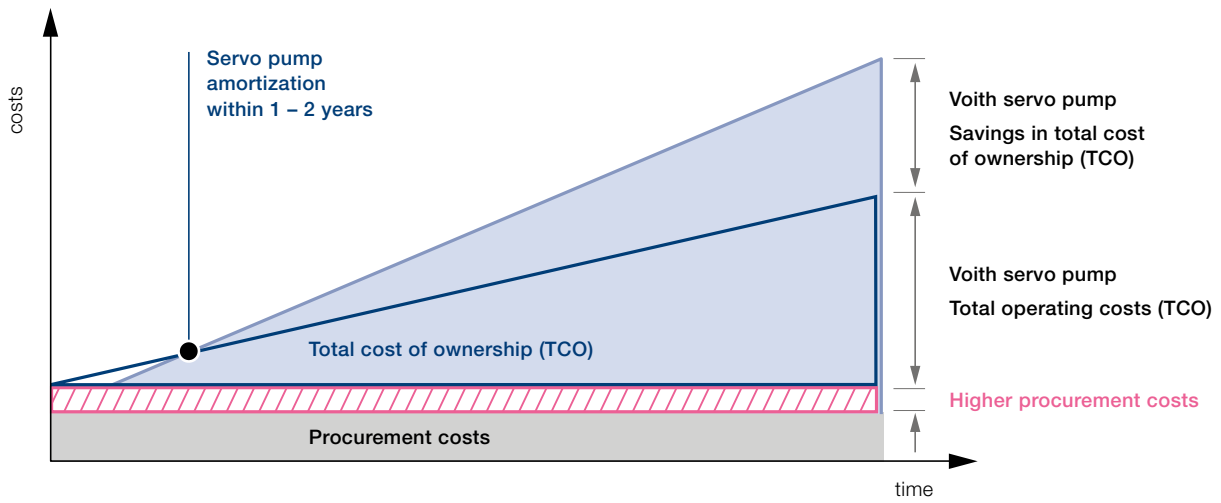
## Comparison of different drive systems. Example: Plastic injection molding machine





Servo pump drive in a 500 kN press

Illustration of procurement cost and total cost of ownership (TCO)



Voith Group  
St. Poeltener Str. 43  
89522 Heidenheim, Germany

Contact:  
Phone +49 7152 992 3  
sales-rut@voith.com  
[www.voith.com/hydraulic-systems](http://www.voith.com/hydraulic-systems)



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