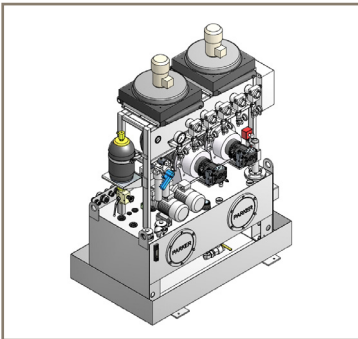


aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Energy Saving Technologies for Motor-Driven Hydraulics

Variable Speed Drive Solutions



ENGINEERING YOUR SUCCESS.

www.comoso.com

Parker Hannifin - the global leader in motion and control technologies

Manufacturing Excellence

It goes without saying that Parker Hannifin know hydraulics. As a world leader in pumps, motors, hoses and fittings, valves, and filtration, Parker is a household name in the industry. But Parker Hannifin also has more than 40 years experience in the design and manufacturing of drives, controls, motors and mechanical products. With dedicated global product development teams, Parker draws on industry-leading technological leadership and experience from engineering teams in Europe, North America and Asia.

A Winning Combination

By combining expertise in the fields of hydraulics and electronics, Parker is poised to offer unique system solutions wherever pumping is involved.

Local Application Expertise

Parker has local engineering resources committed to adapting and applying our current products and technologies to best fit our customers' needs. The convenience of working with one source for electronics and hydraulics is a unique advantage offered by Parker.

Manufacturing to Meet Our Customers' Needs

Parker is committed to meeting the increasing service demands that our customers require to succeed in the global industrial market. Parker's manufacturing teams seek continuous improvement through the implementation of lean manufacturing methods throughout the process. We measure ourselves on meeting our customers' expectations of quality and delivery, not just our own. In order to meet these expectations, Parker operates and continues to invest in our manufacturing facilities in Europe, North America and Asia.

Installation, service and training

As well as delivering effective, efficient solutions adapted to your specific needs, we are keen to ensure that the performance of our products continue to meet your expectations throughout their life.

To this end, we have 24/7, 365 day support provided by a team of experienced application engineers

providing comprehensive help and assistance with all aspects of maintaining the performance of your drive systems.

Parker also offers a whole host of on-site services and maintenance contracts, designed to ensure the maximum possible lifespan of your installations is achieved.

For maximum effectiveness, Parker can also train your teams to enable them to maintain and support your installed products. Training programs and courses are run throughout the year at our training facilities and can be adapted to the specific requirements of your business, or even delivered on-site.



Local Support

Parker provides sales assistance and local technical support through a network of dedicated sales teams and authorized Hydraulics Technology Centers throughout North America. For contact information, please refer to the Sales Offices on the back cover of this document or visit www.parker.com and refer to the distributor locator.

Together, we can reduce your energy usage and save you money

Reduce your energy consumption on hydraulics applications with Parker SSD variable speed drive solutions



Hydraulic Power Units (HPU)

New and retrofit applications

Hydraulic power units are an ideal application for Parker variable speed drives, which can run in setpoint control mode. By receiving inputs representing flow rate or pressure, the drive can maintain just the right pump speed to accurately hold a setpoint. Higher efficiency gained by using the VFD results in less heat to be dissipated. Benefits of noise reduction and energy savings can be achieved on both variable speed pressure compensated and fixed displacement pumps.



Hydraulic Pump Control

Many pressure compensated hydraulic systems can benefit from a variable speed electric motor to control the system flow rate or pressure. To regulate pressure on a fixed displacement pump, speed can be adjusted instead of employing a relief valve. Over-speeding a fixed displacement pump can eliminate the need for a second low pressure/high flow pump or eliminate additional valves and plumbing required to regenerate a hydraulic cylinder. In all cases, energy is saved, noise is decreased, and shock loading and mechanical wear and tear on the mechanics are reduced.



Filtration and Lubrication Systems

Filtration pumps often run unattended, and a reliable drive with auto-restart capability and fault logging is a must. Communications over ethernet or web-enabled Parker HMI's allow remote drive access and diagnostics. Quieter and more efficient operation are additional benefits over a constant speed system.



Hydraulic Test Stands

The potential for energy savings on a test stand is dramatic if a regenerative or common-bus drive is specified. Rather than dissipating energy as heat, a regenerative setup uses the pressure from a unit under test to drive a generator, returning energy to the grid.

Energy saving solution for press

Improved efficiency in hydraulic systems with electronic control technologies

In many industrial processes involving a hydraulic pump, an unregulated motor running at maximum speed is probably wasting energy.

Reducing the motor speed during low flow demand or parts of the cycle requiring pressure to be held can achieve significant energy savings. By using Parker SSD's variable speed drive technology, instant savings can be realized.

By automatically adapting the pump's speed to match changes in demand, Parker's variable speed drives are the perfect addition to many hydraulic systems.

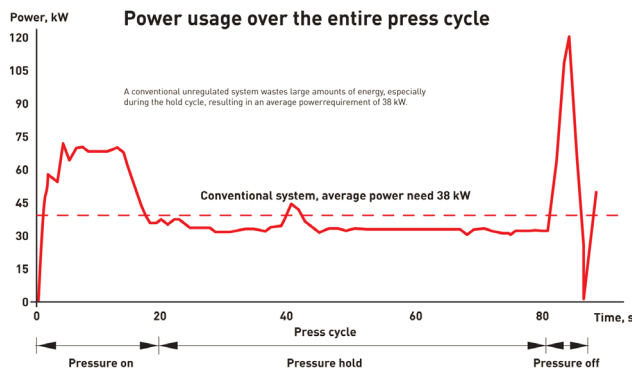
Example of energy saving

Tests run on a hydraulic press system clearly show that substantial savings on energy are possible using the Parker variable speed drive to reduce motor speed during parts of the machine cycle with low flow demand. Plus, by over-speeding a pump at times of low pressure demand, a second pump could be eliminated. The result in this case was an average power need of just 34 HP (25kW) compared to 50 HP (38kW) using an unregulated pump, over the entire press cycle.

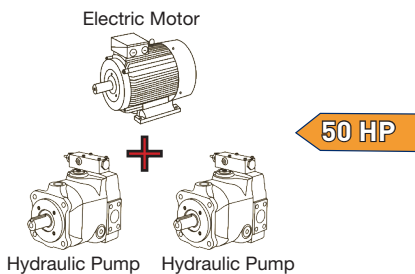
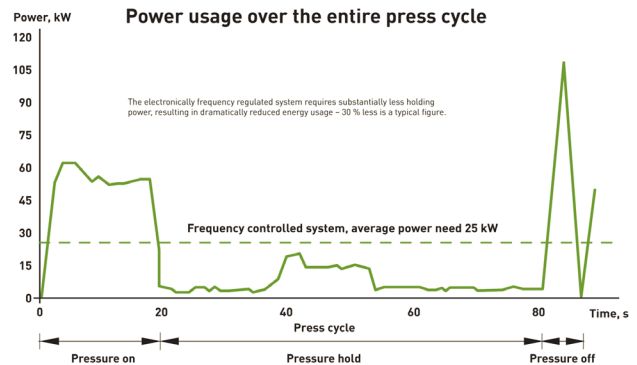
Parker supports you through all aspects of the design and implementation of frequency controlled hydraulic systems - planning, measuring existing equipment, rebuild and startup.



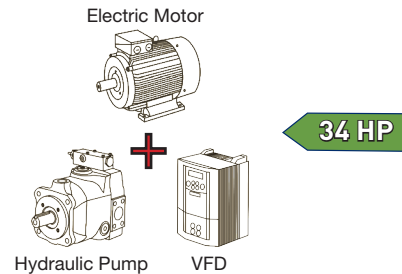
Conventional hydraulic system



VFD controlled hydraulic system



= 38kW x 7200h x \$.10/kWh **\$27,360/Year**



= 25kW x 7200h x \$.10/kWh **\$18,000/Year**

Total annual energy saving = \$9360/Year



Variable Speed Hydraulic Solutions

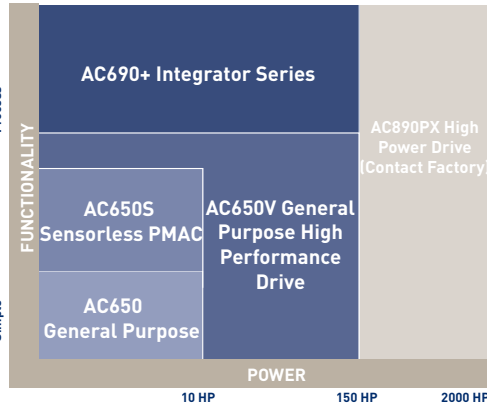
Drives for Induction and PMAC Motors



The **AC650V** range of variable speed drives provide simple speed control of three phase AC induction motors through 150HP (110kW). Thanks to sensorless flux vector technology, the AC650V provides exceptional control at low speeds, accurate speed regulation of variable loads, and high starting torque. With a range of pre-programmed macros, the AC650V is quick to setup and easy to operate. EMC filters, standard up to 10HP (7.5kW) ensure compatibility with current EMC regulations.

The **AC690+** range of drives takes control of three phase AC induction motors through 150 HP to the next level. Offering three modes of operation, v/f, open loop vector, and closed loop vector, the AC690+ provides flexibility for multiple applications. AC690+ offers I/O comparable to a PLC, with function block programmability and pre-programmed macros to boot. Add the expansion module to provide “electronic line shaft”, additional encoder inputs, and additional I/O points.

The above drives can be paired with our line of **energy efficient AC induction motors**. Styles include laminated steel frame for high performance and cast iron frame for extreme environments.

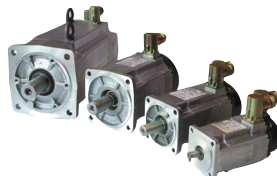


AC Drives Product Range Overview



The **AC650S** range of variable speed drives is unique in that it controls a permanent magnet AC (PMAC) motor without the need for an encoder or other feedback device. PMAC motors are more compact and energy efficient than AC induction motors but traditionally require complex controls. With its innovative control algorithm, the AC650S provides a cost effective, simple solution. Used with the Parker NX series or EX hazardous environment motors, we can provide a single-source solution for pumps through 10 HP (7.5 kW).

Parker NX series PMAC motors are compact but powerful, and more efficient than induction motors of similar power rating. Team with the AC650S range of variable speed drives for an efficient and space effective solution for pumps through 10 HP. For hazardous environments, specify the EX series.



Hydraulic Pumps

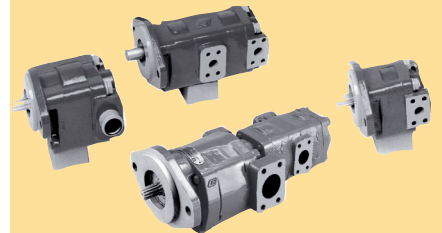
Fixed Displacement Pumps

Vane pumps like the T6 and T7 series offer fast pressure cycle change with precise flow repeatability, and are a good candidate for variable speed control. Likewise, PGP series gear pumps known for high efficiency and low noise at high pressures can benefit from the application of a variable speed drive.

Variable Displacement Pumps

Parker manufactures a range of variable displacement pumps which are also compatible with electronic variable speed drives. The PD series, for example, an axial piston pump is quiet and efficient, but can benefit from adjustable speed. By trimming the shaft speed with a VFD, the power requirement to drive it is reduced. Likewise, the PVplus is a heavy duty piston pump made for demanding industrial applications, and can be made more flexible by introducing variable speed to the equation.

This list is by no means exhaustive. Please consult your Parker sales specialist for additional information on pump/drive compatibility.



Variable Speed Hydraulic Solutions

Application	Description
Q (pump output flow) control	System receives Q (flow) command, with adjustable P (pressure) limit. An efficient alternative to a relief valve. May be run as an open loop system.
P (system pressure) control	System receives P command, with programmed Q limit. Pump maintains a pre-set pressure, while flow follows the system demand, making a fixed displacement pump simulate a variable flow pressure compensated pump. An efficient alternative to a relief valve.
Energy Saver for pressure compensated pumps	System is capable of reducing pump RPM during compensating and low flow periods in order to save energy.
Hi/Lo control	Single pump with VFD is an alternative to traditional High/Low two pump systems. Operates as pressure limit, with flow following system demand.
Accumulator charging	An energy saving control mode, an alternative to pump unloading or frequent across the line starting when accumulator is full.

Features

- Ready to install “Packaged Drive” solutions available
- Simple parameter setting and adjustment
- One common programming software package for all drive series, and provided at no charge
- Multiple communication protocols for easy integration, unattended operation, and remote monitoring

Benefits with Parker VFD

Selection of system components	<ul style="list-style-type: none"> • Standard pumps can be used - fixed or variable displacement • Works with 230-460VAC supplies • Runs three phase motor from single phase supply (limited HP range)
Smooth acceleration and braking	<ul style="list-style-type: none"> • Longer motor service life, with unlimited starts per hour • Less strain on the hydraulics, oil, and other components • No power surges, no pressure surges (cavitation) • Quick response to change in demand
Higher efficiency	<ul style="list-style-type: none"> • Savings on energy consumption, reduced peak power need • Reduced CO₂ emissions • Less oil heating/reduced need for cooling
Compact dimensions	<ul style="list-style-type: none"> • Smaller pumps and coolers needed • System takes up less floor space • Reduced hydraulic oil volume
Reduced noise levels	<ul style="list-style-type: none"> • Less need for noise protection • Improved work environment • Reduced motor shaft rotations • Smoothed resonant frequencies
Integrated concept	<ul style="list-style-type: none"> • Less external hardware • Simple customization, pre-engineered packages available • Fieldbus options (Profibus, CAN, Ethernet, DeviceNet, etc.) • System visualization
Frequency control	<ul style="list-style-type: none"> • Higher overall system efficiency • Increased productivity through higher motor speed • Variable volume flow for constant speed pumps across a wide range • Simple process diagnostics



Packaged Solutions and Systems

The Systems Approach...

While the Parker SSD AC drive product lines are known for being user friendly and intuitive, we understand that some customers prefer the convenience of more support in the design and implementation of their control systems. For this reason, Parker SSD Drives and our network of authorized integrators offer a complete in-house design and build service, enabling you to focus on your core competencies.

Based on the fundamental principles of application expertise, quality, reliability and safety, Parker's systems team are able to undertake all aspects of an electrical control system project, from pre-design specification to on-site commissioning and programming services.

By allowing Parker or one of our qualified integrators to undertake the design, build, programming and commissioning of your pump control system, you can be assured that every aspect of the design, from environmental considerations through component selection to mounting of products has been carefully considered and allowed for.

As an accredited systems builder, Parker SSD Drives are also able to undertake the certification process required to enable systems to be put into service in any number of manufacturing facilities worldwide.

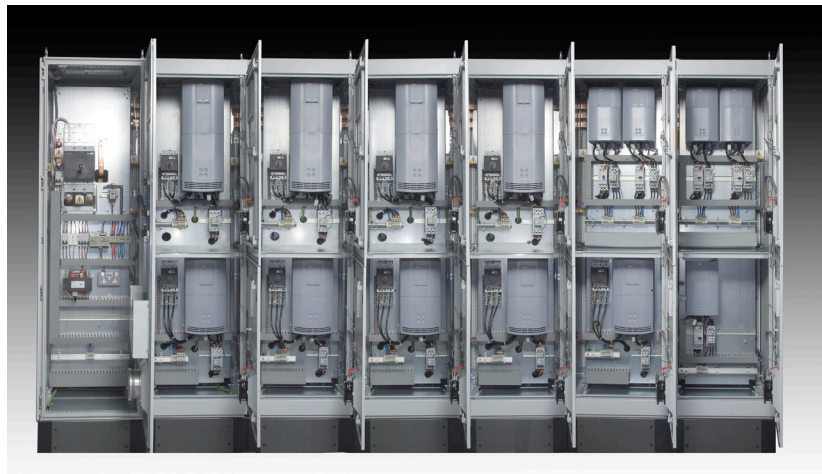
Packaged Drives

Sometimes an application calls for more than just a catalog product. For example, some peripheral components may be required to complete the installation, like a contactor, a set of fuses, or an industrial grade enclosure with operator devices. In cases like this, to keep your in-house costs and labor to a minimum, a "Packaged Drive" may be the best choice. Using our convenient specification form, just select the series and size of drive, and choose the required additional components from a checklist, then submit to your territory manager for a quotation.



Engineered Systems

For more complex applications where multiple motors are to be controlled in a coordinated manner, an engineered system may be appropriate. Systems options can include PLC's, operator interface, and programming for a sequence of operations. Advanced communications and data acquisition capabilities can also be integrated. Parker offers commissioning, startup, and training services with all systems to insure a trouble-free installation and peak performance thereafter.



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