

Eaton's Variable Speed Drive Pump Solutions

Saving energy. Cutting costs. Reducing noise.

Energy efficient

Variable Speed Drive Pump solutions



EATON

Powering Business Worldwide



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Eaton Variable Speed Drive Pump Solutions

With the costs of energy steadily rising, energy consumption is playing a more significant role than ever in the total cost of machine operation. As a result, the hydraulics industry is demanding energy efficient solutions that also meet stringent government regulations for environmental protection.

Proven value and benefits

- Up to 70% energy savings – Sustainability and cost reduction
- Quieter operation – Improved safety and regulation compliance
- Reduced or eliminated cooling needs – Machine cost reduction
- Pump downsizing – Machine cost and footprint savings
- Eaton standard products – Proven reliability and availability



Reduced energy cost and consumption

Eaton's Variable Speed Drive and Pump Systems can help you cut energy usage by up to 70% depending on the machine duty cycle. This can help significantly reduce operating costs, so your investment can quickly pay for itself.

The proven performance and power density of Eaton's pump families combined with the smart control of Eaton Variable Speed Drives enable these systems to achieve power-on-demand more efficiently than conventional constant-speed drive pump systems. Instead of operating constantly at 1500 RPM or 1800 RPM (depending on the region), Eaton's Variable Speed Drive Pumps can be controlled to match the load requirements of the current duty cycle via intelligent control. As a result, you can eliminate energy waste.

Reduced noise pollution

Noise reduction is another significant benefit of running your pumps at variable speeds. The electric motor and pump speed vary constantly in an Eaton Variable Speed Drive System to match the duty cycle requirement. This results in remarkable noise reduction, which helps protect operators' hearing and meets more stringent noise regulations.

Reduced heat generation

With improved energy efficiency comes less heat production, so these systems can often allow you to downsize or even eliminate oil coolers. Otherwise, they can help reduce the amount of hydraulic oil you use and the size of your tanks, thereby extending the life of seals and oil.

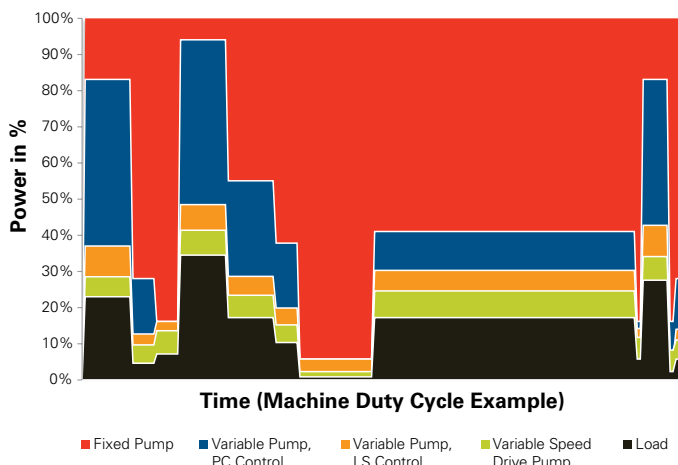
Reduced pump size

Eaton's Variable Speed Drive Pumps open the possibility of downsizing your pumps to cut costs. Because the system can run higher than 1500 RPM or 1800 RPM, you can reduce the pump displacement requirement proportionally for the same amount of flow—shrinking the machine's overall footprint.

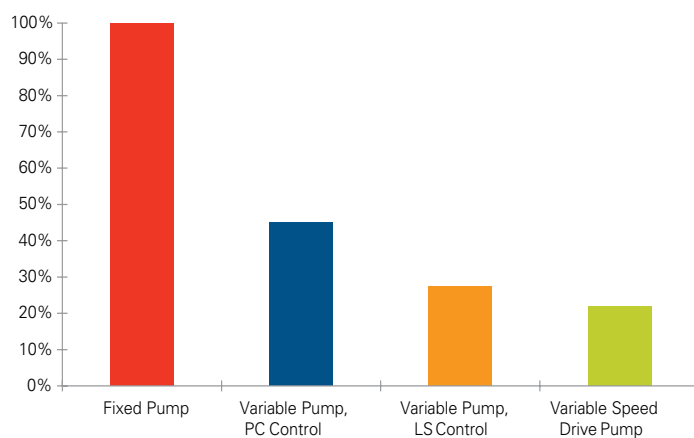
Backed by experienced application engineering, service, training and sales support—as well as the power of one Eaton—Eaton's proven pump and variable speed drive products can be a powerful combination to resolve challenges in today's demanding market.

Energy Consumption Comparison of Different Types of Pump Systems

Energy Consumption Comparison



Energy Cost Comparison



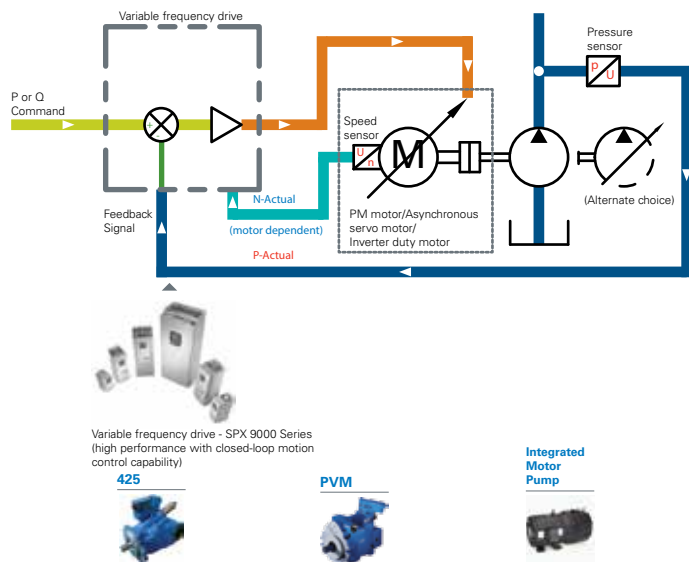
Pump and Drive Selection Guide

Pump	Displacement (cc/rev)	Nominal Pressure (bar)	Min speed (rpm)	Max speed (rpm)	Hydraulic Closed-loop motion control			Hydraulic Open-loop motion control						
					Plastics	Press	Machine tool	Die casting	Oil/Gas/Marine	Processing	General industrial			
Piston														
425 series	80	210	0	2200	✓							✓		
PVM	18-141	up to 315	0	up to 2800	✓	✓	✓		✓		✓	✓		
PF(V)X & PV(F)W	66-750	350	0	up to 1800		✓			✓		✓	✓		
Vane														
VMQ	10-240	290	200	up to 3000				✓	✓		✓	✓		
V series	7-193	up to 210	200	1800								✓		
V10 & 20	3-42	up to 170	200	up to 3400			✓							
IMP														
Integrated motor pump package	Depending on pump choice					✓			✓		✓	✓		
Drive														
Standard performance VFD, DG1									✓	✓	✓	✓		
High performance VFD, SPX9000						✓	✓							

Note

1. For details see speed-pressure performance curve in catalog
2. Consult Eaton application engineering for details as needed

Closed-loop motion control mode



Eaton pumps

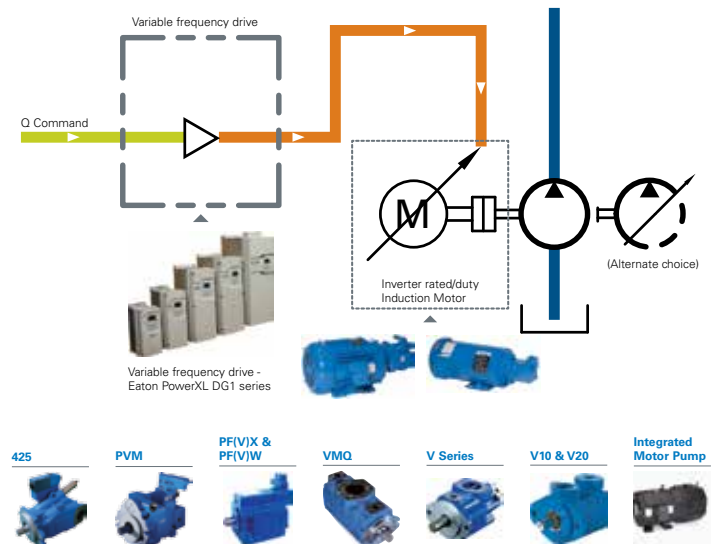
- 425 Dual-Displacement piston pump – 210 bar, 80cc, min speed 0 rpm, max 2200 rpm
- PVM Variable piston pump – up to 315 bar, 18-141cc, min speed 0 rpm, max up to 2800 rpm
- PF(V)X & PF(V)W Hydrokraft Fixed and Variable piston pump – 350 bar, 66-750cc, min speed 0 rpm, max 1800 rpm
- VMQ vane pump – up to 290 bar, 10-240cc, min speed 200 rpm, max up to 3000 rpm
- V series vane pump – up to 210 bar, 7-193cc, min speed 200 rpm, max 1800 rpm
- V10&V20 vane pump – up to 170 bar, 3-42cc, min speed 200 rpm, max up to 3400 rpm

Eaton integrated motor pump (IMP) package

- Pump choices - VMQ, V series, PVM, PVQ

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Open-loop motion control mode



Eaton drive: PowerXL DG1 series, standard performance variable frequency drive

- Up to 90KW, 230V/480/575V
- Built-in I/O - 8DI, 1DO; 2AI, 2AO; 2FC, 1FA relays
- Built-in communications - EtherNet/IP, Modbus TCP; Modbus RTU, BACnet MS/TP

Eaton drive: SPX9000 series, high performance variable frequency drive

- Built-in I/O - 6 DI, 1 DO, 2 AI, 1AO, 2 RO (NC-NO)
- Up to 1500KW, 230V/480V/575V
- Optional communication protocols, such as Ethernet/IP, Profibus DP, CANopen, etc.

PM motor / asynchronous servo motor / inverter duty motor

- Customer choice

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