



ADVANCED ACTUATION

Kyntronics SMART Hydraulic Actuators, (known as Electro-Hydraulic Actuators) - Comparison with Hydraulic Cylinder Actuation Systems

Technical Bulletin:

SHA Comparison with
HPU-Driven Hydraulic
Cylinders

Products:

Smart Hydraulic
Actuator (SHA):
S, E, H Series

While Hydraulic Cylinder Systems are a well-established motion control solution, Kyntronics' innovative EHA (Electro-Hydraulic Actuation) technology provides an efficient, simpler, smaller, more reliable, and more cost-effective alternative

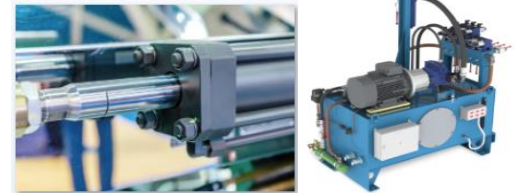
A Hydraulic Power Unit (HPU) driven hydraulic cylinder requires many components and design considerations to provide precise motion control. Components typically include:

- Pumps and Motors
- Cylinders
- Fluid tank, accumulators and filters
- Hydraulic Lines and fittings
- Servo control valves
- Electrical components and connections
- Pressure transducers and position sensors
- A control system

In addition to component costs, a Hydraulic Cylinder Actuation System requires significant time to engineer and build, including; selecting the proper components, developing a detailed bill of materials, allocating proper mounting space for the components, providing for position/force control, incorporating hose/wire routings plus other supporting infrastructure.

A Hydraulic Cylinder Actuation System infrastructure is typically over-sized to accommodate application requirements and these systems generally run continuously, wasting energy and creating unwanted noise.

They also require a considerable amount of hydraulic fluid and are susceptible to leaks due to the number of connections associated with this type of system which create reliability issues and environmental hazards.



HPU-Driven cylinders have many components and connection points



Kyntronics SMART Hydraulic Actuator (SHA) System

Often referred to as an Electro-Hydraulic Actuator (EHA), Kyntronics SHA is a drop-in, All-in-One solution. After simple mounting and hook-up of electrical connections, the SHA is ready to start producing. The SHA's efficient method of converting electrical power to mechanical force results in a smaller, cost-effective package and it's "power on demand" feature provides significant energy savings. In addition, savings in component costs and space are substantial compared with a Hydraulic Cylinder Actuation System.

Interested in how Kyntronics can help solve your actuation challenges, [contact our Engineering team](#).

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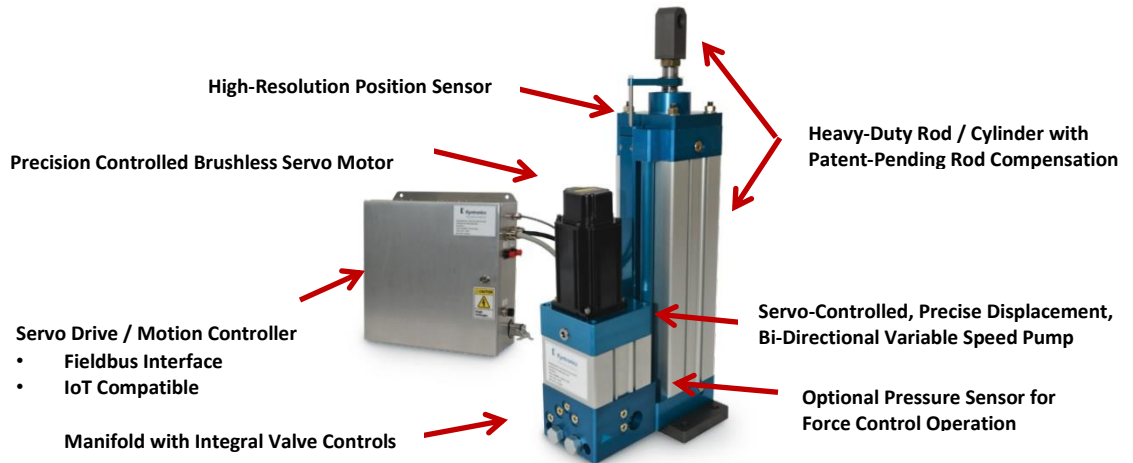
Kyntronics Smart Hydraulic Actuator Features

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SMART Hydraulic Actuator (SHA) vs. Hydraulic Cylinder - Actuation Technology Comparison

Requirement	Kyntronics SHA	Hydraulic Cylinder Actuation System	Feature / Benefit
High Force Density	✓	✓	Hydraulic technology provides the maximum force density compared with Roller Screw, Ball Screw or Pneumatic Actuation Technology
Variable Speed Servo Control	✓		The SHA incorporates a servo motor and variable speed pump for precise control of position, force and speed
Energy Efficiency	✓		The SHA only consumes power when it is moving the load
All-In-One System / Small Footprint	✓		The SHA combines the motor, pump, manifold, cylinder and electronic controls all into a single system
Quiet Operation	✓		The SHA motor/pump is smaller than most HPUs and only operates when it is moving the load.
Cost Effective / Lower Equipment Cost	✓		All-In-One design of the SHA eliminates the HPU, hoses and hydraulic infrastructure. The SHA is sized for the application... no more oversized HPUs.
Reliability/Leak Prevention	✓		The SHA eliminates hydraulic hoses and connections thus preventing leaks
Simple Fieldbus Control Connectivity, IoT integration	✓		The SHA has several standard control interfaces available (CANopen, Ethernet TCP/IP, Ethernet CAT, Ethernet IP, Modbus TCP, Modbus RTU, etc.) to enable simple integration to control systems and support IoT connectivity
Eliminate Actuation System Design and Build Time	✓		The SHA is shipped from the factory fully configured as a standard product ready to install.

Kyntronics SMART Hydraulic Actuator (SHA) addresses many of the shortcomings of Hydraulic Cylinder Actuation Systems. SHAs are a very cost-effective solution for a multitude of applications ranging from simple applications requiring a load to be moved from point A to point B, to higher precision applications with position, force and speed control and multi-axis synchronization.

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