



## H-SERIES

## High Speed /High Force SMART Hydraulic Actuator

Replace Costly and Messy Hydraulic Actuation Systems and HPU's with the **New H-Series, All-in-one Actuator**. An Innovative Actuation System that Combines High Speed & High Force Capability.

**All-In-One  
Solution:  
Servo Drive,  
Motor, Actuator  
& Software**

**Up to 170,000  
Lbs (755 kN)**

**Up to 45 in/s  
(116 cm/s)**

**Position and  
Force Control**

**Completely  
closed system,  
no hoses,  
no leaks**

### H-Series Control Features:

Position or Force  
or Position &  
Force Control

Programmable  
transition point  
provides ability to  
switch from High  
Speed mode to High  
Force mode at any  
position

Has the capability to  
switch multiple times  
as desired during  
the stroke

Four quadrant servo  
motion control in both  
the High Speed or  
High Force modes

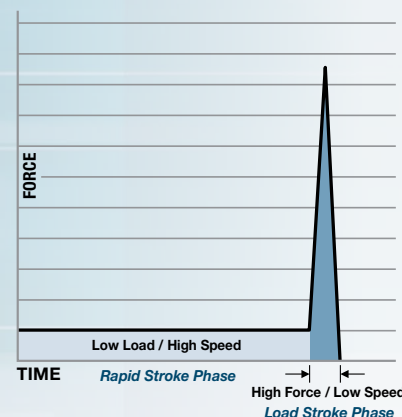
Fieldbus Interface

### Challenge

Applications such as Presses, Metal Forming, Plastic Molding, Clamping and others present the challenge of having a long stroke at a low force combined with a steep ramp-up to a high force for a short period. These applications often require either an oversized and expensive hydraulic infrastructure, or costly electro-mechanical actuators to provide the high speed and high force required.

Kyntronics has developed an innovative, patent-pending solution to this problem that is based on Kyntronics all-in-one SMART Hydraulic Actuator (SHA) technology. The H-Series couples a high-speed cylinder with a high-force cylinder (or pair) into a compact, cost effective solution with precision accuracy.

### Load Profile (Force vs. Time)



**Servo-Controlled, Precise Displacement  
Bi-Directional Power Unit**

**Optional Pressure Sensor for  
Force Control Operation**

**Manifold with  
Integral Valve Controls**

**Brushless Servo Motor**

**High Speed Cylinder**

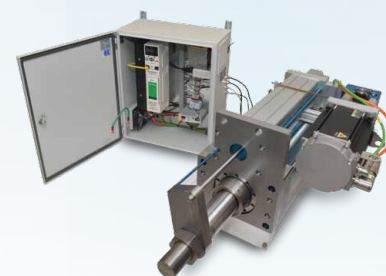
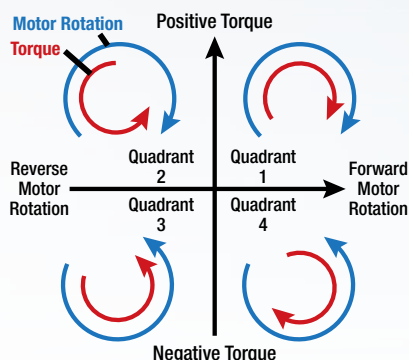
**High-Resolution  
Position Sensor**

**Compact/Integrated  
Accumulator**

**High Force Cylinder**

### Single Cylinder Model

### Four quadrants of torque limits



**Kyntronics**  
Innovation in Motion

## Typical applications:



Injection Molding



Blow Molding



Punching Presses



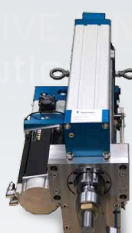
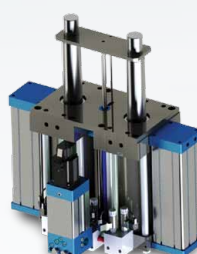
Metal Forming Press

- Injector Carriage
- Thermoforming Platen
- Platen Clamping
- Trim Press

## H-Series SMART Hydraulic Actuator (SHA) - Comparison of Actuation Technologies

| Requirement   | Kyntronics H-Series SHA | Hydraulic Cylinder Actuators | Electro-Mechanical Ball Screw/Roller Screw (EMA) | Feature / Benefit   |
|---|-------------------------|------------------------------|--|---|
| Compact / All-In-One System                           | X                       |                              |  | The H-Series SHA combines the motor, pump, manifold, cylinders, valving and electronic controls all into a single system shipped from the factory fully engineered and ready to install. Both hydraulic cylinder solutions and EMAs must be "system-engineered" and substantially over-sized to achieve the required speed and force performance making them expensive and bulky.   |
| Cost Effective / Lower Equipment Cost                 | X                       |                              |  | The H-Series SHA is significantly more cost-effective because it is optimally sized for these applications unlike hydraulic systems and EMAs which must be substantially over-sized to meet the simultaneous extremes necessary for high speed and high force operation.  |
| Energy Efficiency - Power-on-Demand                   | X                       |                              |  | The H-Series SHA only consumes energy when operating compared with hydraulic cylinders/HPUs that run continuously and EMAs with energy-wasting friction from metal-to-metal contact points.   |
| Precise control of speed, force and position          | X                       |                              | X  | Both the H-Series SHA and EMA actuators incorporate servo technology providing excellent motion control capabilities. Force control with the SHA is less expensive whereas an EMA requires an expensive load cell.  |
| Environmentally Friendly / Reliable / Low Maintenance | X                       |                              |  | The H-Series SHA is an all-in-one sealed system which eliminates the hoses and leaks inherent with hydraulic systems and it does not require maintenance other than a rod seal change after tens of millions of inches of travel regardless of load. Comparably-sized EMAs will last a fraction of the time and require frequent lubrication. Localized thread wear on EMAs can be significant if the load is uneven over the length of travel. |
| Ability to sustain "shock loading" conditions         | X                       | X                            |  | The hydraulics in the H-Series SHA are designed to absorb "shock loads" in contrast with an EMA which can incur significant screw and drive train wear or damage from shock loads.  |

## H-Series SMART Hydraulic Actuator - Product Specifications

|   | Model         | Rapid Stroke Phase               |                                 | Load Stroke Phase                 |                                 |
|---|---------------|----------------------------------|---------------------------------|-----------------------------------|---------------------------------|
|   |               | Maximum High Speed Force lbf (N) | Avg. High Speed in/sec (cm/sec) | Maximum High Force lbf [Ton] (kN) | Avg. High Speed in/sec (cm/sec) |
| <br><b>Single High Force Cylinder Models</b> | 1H19C10-32-36 | 915 (4,072)                      | 45.6 (115.9)                    | 18,900 [9.4] (84)                 | 3.0 (7.6)                       |
|   | 1H19C10-40-36 | 890 (3,961)                      | 45.6 (115.9)                    | 28,629 [14.3] (127)               | 2.0 (5.2)                       |
|   | 1H19C10-50-36 | 840 (3,738)                      | 45.6 (115.9)                    | 44,733 [22.4] (199)               | 1.3 (3.4)                       |
|   | 1H19C10-60-36 | 815 (3,627)                      | 45.6 (115.9)                    | 64,416 [32.2] (287)               | 0.9 (2.4)                       |
| <br><b>Dual High Force Cylinder Models</b>    | 2H19C10-32-34 | 1,206 (5,365)                    | 36.0 (91.5)                     | 47,880 [23.9] (213)               | 2.4 (6.0)                       |
|   | 2H19C10-40-34 | 1,181 (5,254)                    | 36.0 (91.5)                     | 72,528 [36.3] (323)               | 1.6 (4.1)                       |
|   | 2H19C10-50-34 | 1,131 (5,032)                    | 36.0 (91.5)                     | 113,324 [56.7] (504)              | 1.0 (2.7)                       |
|   | 2H19C10-60-34 | 1,106 (4,920)                    | 36.0 (91.5)                     | 163,187 [81.6] (726)              | 0.7 (1.9)                       |
|   | 2H19C20-32-34 | 6,624 (29,467)                   | 7.2 (18.3)                      | 47,880 [23.9] (213)               | 1.9 (4.8)                       |
|   | 2H19C20-40-34 | 6,599 (29,356)                   | 7.2 (18.3)                      | 72,528 [36.3] (323)               | 1.4 (3.5)                       |
|   | 2H19C20-50-34 | 6,549 (29,133)                   | 7.2 (18.3)                      | 113,324 [56.7] (504)              | 0.9 (2.4)                       |
|   | 2H19C20-60-34 | 6,524 (29,022)                   | 7.2 (18.3)                      | 163,187 [81.6] (726)              | 0.7 (1.7)                       |

## About Kyntronics

An ISO 9001; 2015, AS9100D certified company, all Kyntronics actuation products are made in the USA. With vast experience in industrial, aerospace and medical industries, our in-house team of mechanical, electronics, hydraulic and software engineers combine to provide hundreds of years of engineering acumen. Customer-centric, we thrive on 'solving the unsolvable' application problems in working with customers worldwide.

To discuss your application and learn how the High-Speed /High-Force SMART Hydraulic Actuator can improve your machine design, contact Kyntronics today!



Innovation in Motion

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