Kyntronics

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High Speed / High Force All-In-One Actuator

New *– High Speed / High Force, All-in-one Actuator solves the problem of having to oversize actuation components for applications that have a rapid stroke at low force with a load stroke at high force.*

All-In-One Modular Design

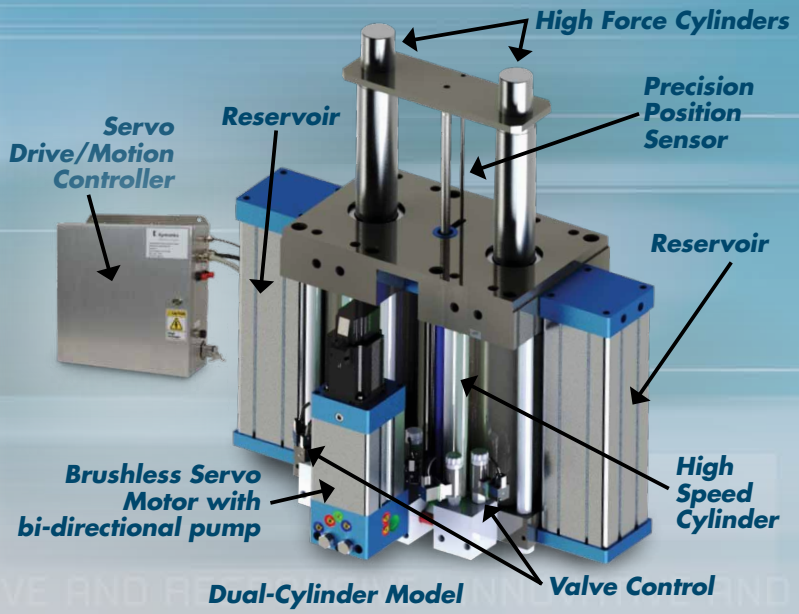
Up to 45.6 in/sec (115.9 cm/sec)

Up to 170,000 Lbs (755 kN)

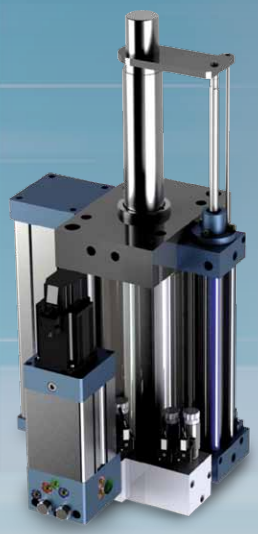
Position and Force Control

Completely closed system, no hoses, no leaks

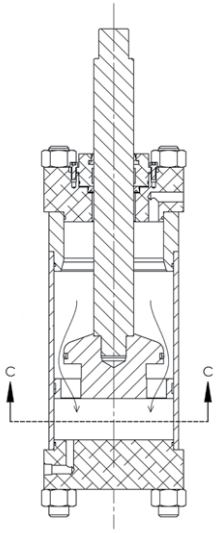
Fieldbus Control Options



Dual-Cylinder Model

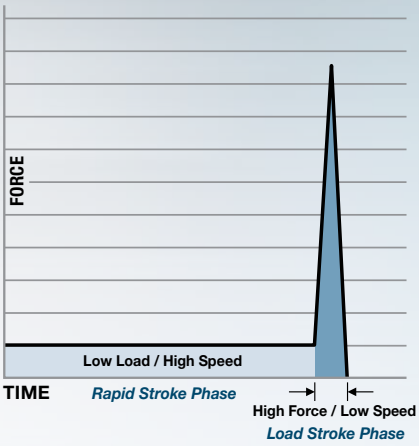


Single Cylinder Model



RETRACT POSITION

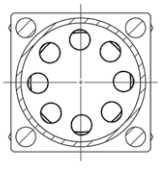
Load Profile (Force vs. Time)



Challenge

Applications such as Metal Stamping, Injection 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 high-cost electro-mechanical actuators to provide the high speed and high force necessary.

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 HSHF couples a high-speed cylinder with a high-force cylinder (or dual pair) into a compact, highly cost effective solution with precision accuracy.



SECTION C-C

A key feature is our Patent Pending cylinder / piston design that allows high-speed operation with a seamless transition to producing high force during the Load Stroke phase

Kyntronics

Innovation in Motion

Typical applications:

Injection Molding

Blow Molding

Toggle Clamping

Presses

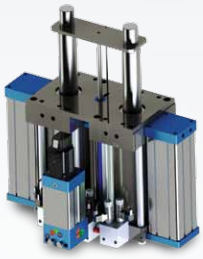
- *Injector Carriage Actuation*
- *Thermoforming Platen Actuation*
- *Platen Clamping*
- *Trim Press Actuation*

High-Speed / High-Force SMART Hydraulic Actuator (SHA) - Comparison of Actuation Technologies

Requirement	Kyntronics High-Speed / High-Force SHA	Hydraulic Cylinder Actuators	Electro-Mechanical Ball Screw / Roller Screw (EMA)	Feature / Benefit
Compact / All-In-One System	X	X		The High-Speed/High Force 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 High-Speed/High-Force 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 High-Speed/High-Force 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. In addition, EMAs often require "pre-loading" to reduce backlash which consumes energy that is not transferred to moving the load.
Precise control of speed, force and position	X		X	Both the High-Speed/High-Force 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 High-Speed/High-Force 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 High-Speed/High-Force 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.

High-Speed / High-Force SMART Hydraulic Actuator - Product Specifications

Single High Force Cylinder Models



Dual High Force Cylinder Models

	Model	Rapid Stroke Phase: Avg. High Speed in/sec (cm/sec)	Rapid Stroke Phase: Maximum High Speed Force lbf (N)	Load Stroke Phase: Avg. High Speed in/sec (cm/sec)	Load Stroke Phase: Maximum High Force lbf [Ton] (kN)
Single High Force Cylinder Models	HSHF-1-10-32	45.6 (115.9)	1,261 (5,608)	3.3 (8.3)	24,887 [24.9] (111)
	HSHF-1-10-40	45.6 (115.9)	1,236 (5,497)	2.2 (5.5)	37,699 [37.7] (168)
	HSHF-1-10-50	45.6 (115.9)	1,186 (5,275)	1.4 (3.5)	58,905 [58.9] (262)
	HSHF-1-10-60	45.6 (115.9)	1,186 (5,275)	1.0 (2.4)	84,823 [84.8] (377)
Dual High Force Cylinder Models	HSHF-2-10-32	45.6 (115.9)	1,086 (4,830)	1.6 (4.2)	49,775 [24.9] (221)
	HSHF-2-10-40	45.6 (115.9)	1,036 (4,607)	1.1 (2.7)	75,398 [37.7] (335)
	HSHF-2-10-50	45.6 (115.9)	936 (4,163)	0.7 (1.8)	117,810 [58.9] (524)
	HSHF-2-10-60	45.6 (115.9)	936 (4,163)	0.5 (1.2)	169,646 [84.8] (755)
	HSHF-2-15-32	21.5 (54.6)	4,031 (17,931)	1.6 (4.2)	49,775 [24.9] (221)
	HSHF-2-15-40	21.5 (54.6)	3,981 (17,709)	1.1 (2.7)	75,398 [37.7] (335)
	HSHF-2-15-50	21.5 (54.6)	3,881 (17,264)	0.7 (1.8)	117,810 [58.9] (524)
	HSHF-2-15-60	21.5 (54.6)	3,881 (17,264)	0.5 (1.2)	169,646 [84.8] (755)

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!

Kyntronics

Innovation in Motion

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