# **EXCELLENCE IN HYDRAULIC TECHNOLOGY BEGINS WITH MOOG**

Moog electro-hydraulic products, such as Servo and Proportional Valves, Industrial Cartridge Valves and Radial Piston Pumps, provide precise control of position, velocity and force - so important to the proper operation of a wide variety of industrial machinery, e.g. accurate control of the thickness of metal sheet in steel mills or the thickness of paper sheet in paper machinery, pumping low-flammability fluids or controlling velocity and pressure in plastic injection molding machine.

### Radial pistion pumps

- Ideal for applications requiring high performance, low noise, contamination-resistant design and reliability
- Available in various sizes, single and multiple configurations, and with a wide array of control options and mounting flanges



### Industrial cartridge valves

- Ideal for applications which require high flow rates and leak-free control
- Available in numerous sizes and configurations



## Hydraulic Manifold Systems

- Provides complete, independent control of hydraulic pressure applied to individual stations or systems operating from a single hydraulic power supply
- Enhances safety and allows predictable system control



# THE MOOG DIFFERENCE

Fully customizable (even for reduced quantities) to meet all performance requirements

> Maximum flexibility in terms of design and preformance

High dynamic capabilities for fast heavy duty cycle

Can be used in conjunction with complementary Moog's range of best in class servovalves and motion controller

Possibility of drop-in solution to retrofit existing equipments

## **PROFESSIONAL SERVICES** TAILORED TO YOUR UNIQUE NEEDS

Moog Global Support is our promise to help maintenance professionals worldwide maximize uptime and get more from your machine investment. We are your trusted service partner for responsive support and motion control know-how.



### www.moogglobalsupport.com

# **MORE PRODUCTS. MORE SUPPORT.**

Moog designs a range of motion control products to complement those featured in this document. Moog also provides service and support for all of our products. For more information, contact the Moog facility closest to you.

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Moog ball screws, planetary and inverted roller screws Rev. 0. December 2016

WHAT MOVES YOUR WORLD

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MOOG

# **MOOG HYDRAULIC** SERVOACTUATOR



# MOOG

# FLEXIBLE DESIGN AND SUPERIOR ACCURACY FOR HIGH PERFORMANCE APPLICATION

Moog design and produce a variety of Generalpurpose Hydraulic Linear Actuator families for light and heavy duty industrial applications. For over 50 years Moog have developed Linear Actuators initially for Aircraft subsequently for industrial applications adopting various technologies:

- "Low Friction Hydraulic Gasket Linear Actuators" using low friction PTFE gaskets
- Hydraulic Linear Actuators with hydrodynamic bearings
- Hydraulic Linear Actuators with hydrostatic bearings

The synergy between these actuators and Moog servo valves forms a unique product able to satisfy most demanding customer's requirements and offers a best-in-class solution among hydraulic actuation systems.

### Gasket Actuators (Low Friction)

- Those actuators are usually installed in conventional ways by means of hinges or hubs. The installation with sferical rod ends an eye-bolt is possible as well.
- The threaded rod-end can be either "male" or "female"
- The piston and the rod are manufactured using standard raw materials and they can be either single or double effect
- The internal configuration can be either single or double rod

can be integrated

- Use a low friction gasket (usually PTFE)
- The piston and rod are usually machined starting from a solid bar Such a layout reduces the friction • Hydraulic manifold for servovalve
- Extensive Moog Servovalve portfolio is available for integration
- Standard ISO6022 design on request
- Fully customized design possible

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### Hydrodynamic Actuators

- Those actuators are suitable for motion at high frequency and long stroks
- The piston and rod are machined starting from a solid bar to achieve a very good alignment and optimum piston to cylinder matching
- Usually they are designed as "double rod"

Hydrostatic Actuators

especially suitable for dynamic

requiring smooth movements and

• The piston and rod are machined

piston to cylinder matching

those applications with radial loads

starting from a solid bar to achieve a

very good alignment and an optimum

tests at very high frequency

• That family of actuators is

- The piston is coated with an "anti-friction soft material" and it is driven by the hydrodynamic cushion that is created with the movement
- A contactless sealing bushing allows very low friction and minimum stick slip

• Usually they are designed

by a dedicated circuit. In such

and even in case of small

a way even at very high frequency

displacement, the rod is lubricated by the pressurized oil that

"produces, as well, the needed lift"

bearings pressurized at high pressure

as "double rod"

• Low friction 2nd stage sealing and scraper are designed to allow high speed any high motion frequencies

#### • The rod moves driven by hydraulic the actuator's rod

• The piston and the bearings are coated by an "antifriction soft material"









erating pressure	Up to 280 bar
eed range	Up to 1 m/s
oke range	Up to 1500 mm
eral load	<5% nominal force
ton diameter	Up to 300 mm

erating pressure	Up to 280 bar
eed range	Up to 3 m/s
roke range	Up to 600 mm
teral load	<5% nominal force
ton diameter	Up to 300 mm

perating pressure	Up to 280 bar
beed range	Up to 3 m/s
roke range	0 to 600 mm
iteral load	Up to 40% nominal force
ston diameter	Up to 300 mm

# SERVOVALVE PORTFOLIO

MECHANICAL FEEDBACK (MFB)



• Robust construction for use

temp/high shock environments

in extreme environments

• Suitable for use in high

Very high response valve

options available

Pilot

G631

G761

G771

ELECTRICAL FEEDBACK (EFB)



ELECTRICAL FEEDBACK (EFB)







- Inherently high resolution for extreme accuracy requirements
- Integral Diagnostic function High flow valve options
- available approved options
- ccommodates

D685

from 3 to 3800 l/min @ 70 Bar

from 15 to 150 Hz (90° Phase

Frequency Response

Lag, +/- 25% Signal (Hz)

PLC command signals

Nozzle

Flapper

D765

D791

D792

• Simple onboard diagnostics

low control	Pressure contro (PQ)
0633	D638
0634	D639
D636	
0637	

Rated Flow from 3 to 150 l/min @ 70 Bar Delta P

Frequency Response from 50 to 150 Hz (90° Phase Lag, +/- 25% Signal (Hz)

### DIGITAL (DCV) AND AXIS (ACV) CONTRÓL VALVE



- Integrate Digital Electronics with fieldbus technology
- Sophisticated diagnostic software and error handling capabilities
- Software configurable valve function
- Simplifies multi-axis system communications
- Integrated "System" closed loop controller (ACV)

Flow control	Pressure control (PQ)
D636	D638
D637	D639
D671	D941
D672	D942
D673	D943
D674	D944
D675	D945

Rated Flow from 3 to 3800 l/min @ 70 Bar Delta P

Frequency Response from 15 to 150 Hz (90° Phase Lag, +/- 25% Signal (Hz)

<ul> <li>Intrinsically Safe Atex Approved Options</li> <li>Simple integration and commissionig</li> </ul>	• Exd Atex approve • Directly Accomm common PLC con	
Nozzle Flapper Pilot	Servojet	DDV pilot
G631	D661	D681
G761	D662	D682
G771	D663	D683
G772	D664	D684

D665

Rated Flow

Delta P



from 3 to 500 l/min @ 70 Bar Delta P

Frequency Response from 30 to 300 Hz (90° Phase Lag, +/- 25% Signal (Hz)

- Inherently high resolution for extreme accuracy requirements
- High Force Linear motor technology provide greater energy efficieny
- Operates down to zero supply pressure
- Analogue Pressure control technology option