



# *Limitorque Fluid Power Systems*

Heavy-Duty Actuation and Control Systems





## ***Quality, Dependability and Productivity***

*Flowserve Limitorque Fluid Power Systems makes valve control easier in ways as diverse as the applications in which its products are used. LFPS pneumatic and hydraulic actuators deliver 37 to 250,000 Nm (327 to 2.2M in-lb) of precisely controlled torque—safely automating valves for all types of applications.*

Available in a wide range of materials suitable for use in the most demanding conditions, Limitorque Fluid Power Systems actuators are complemented by a comprehensive range of control systems including ESD, PST, Line-Break and Quick Closing options. A suite of standard controls systems is available for short delivery, but the LFPS engineering team can design custom solutions for the largest and most complex customer requirements.

To complete the automation package, Limitorque Fluid Power Systems offers accessories such as lockout modules and gear overrides and provides engineering design services for mounting hardware, ensuring that your actuation solution is ready to handle the toughest challenges.

## Limitorque Heavy-Duty Actuators

The Limitorque Fluid Power Systems actuators provide up to 250,000 Nm of heavy-duty torque. Enhanced performance is achieved by using a superior Scotch yoke support design that significantly reduces transverse loads. LFPS actuators feature modular construction to minimize repair time and initial cost while maximizing process availability.

### Features

- True modular design for maximum flexibility
- Carbon steel construction (stainless steel on request)
- Straight or canted yoke with enclosed slot for maximum strength and cycle life
- Optimized yoke bore to accommodate large valve stems
- Suitable for on-off or modulating (control valve) applications
- Single acting spring return configurations: fail open or fail closed
- Double acting configurations: single or double cylinders
- Full range of override options: manual, geared, and hydraulic

### Specifications

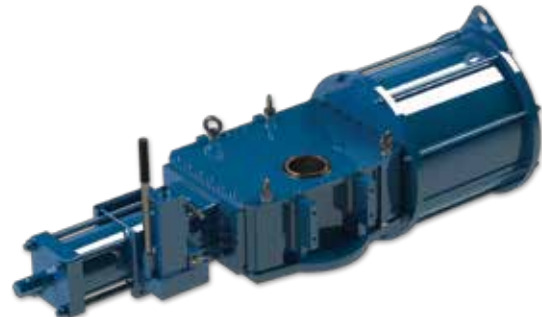
- Torque Range
  - o Double Acting: 37Nm to 250KNm (327 in-lb to 2.2M in-lb)\*
  - o Single Acting Spring Return: 37 Nm to 150,000 Nm (327 in-lb to 1.3M in-lb)

\* For sizes up to 800,000 Nm (7M in-lb) please consult the factory

- Pressure Inputs
  - o Up to 12 bar
  - o Air, nitrogen or sweet gas (for sour gas application please consult the factory)
- Temperature Range
  - o -29°C to 100°C (standard product)
  - o Low temperature (to -60°C) and high temperature (to 148°C configurations available)

### Certifications/Approvals

- IP66 and IP67M per EN60539 (IP68 upon request)
- NEMA4 and NEMA4X per NEMA 250
- PED 97/23/EC (upon request)
- ASME VIII D1 (upon request)
- ATEX EX II2GD EExc
- Designed and tested to EN15714
- SIL 3 Certified (details upon request)



Double Acting with Hydraulic Override Cylinder



Double Acting with Manual Override

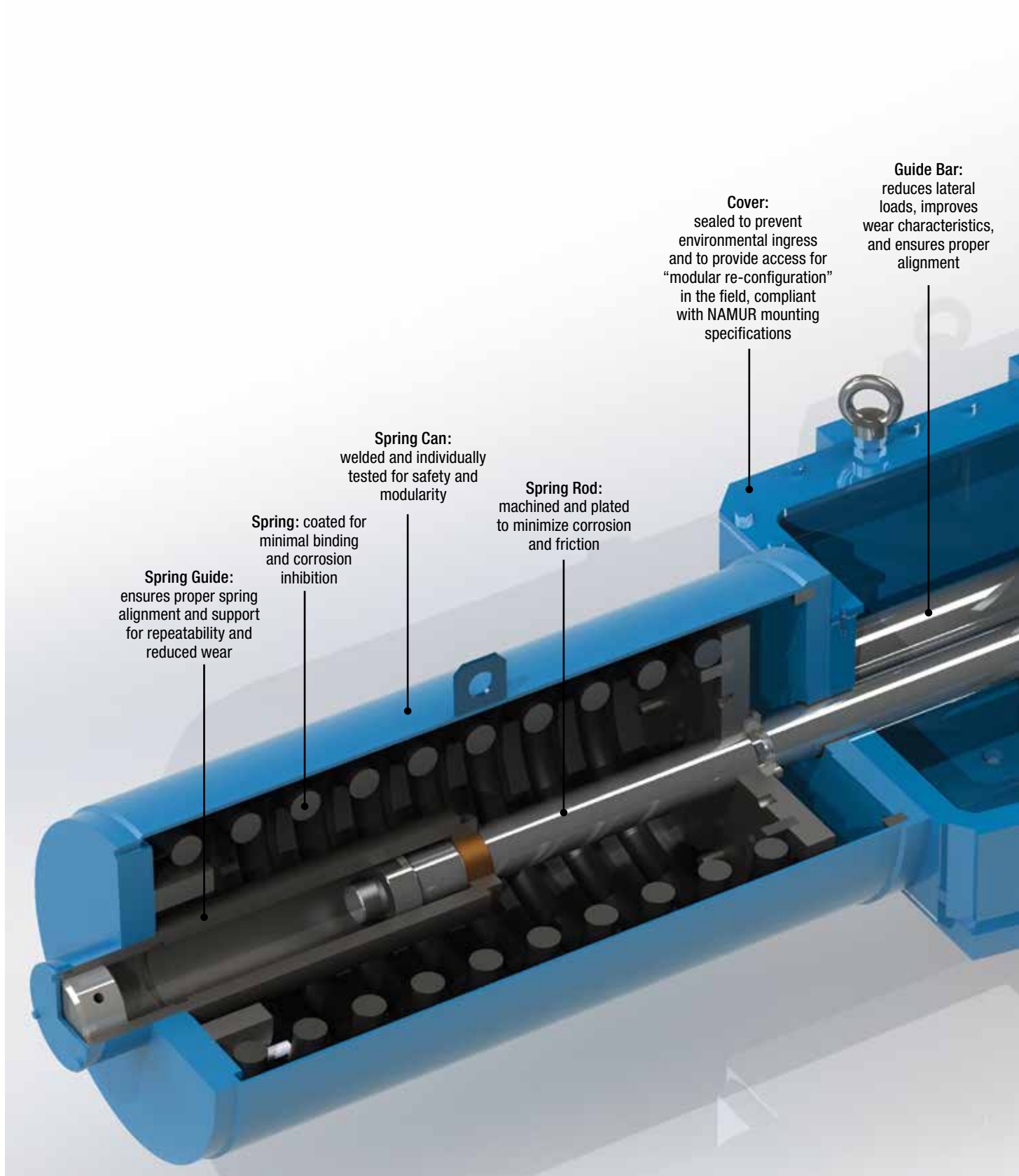


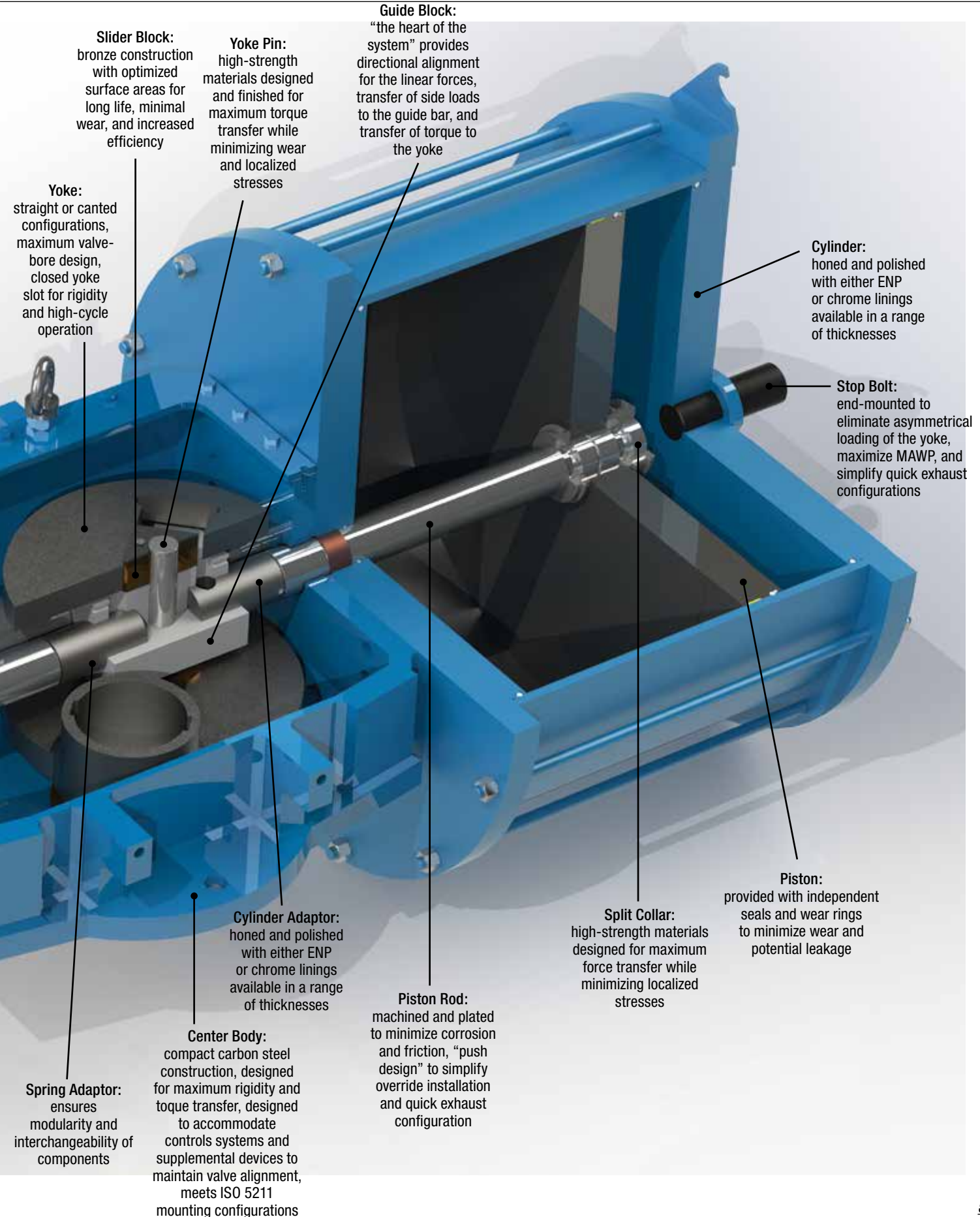
Single Acting with Hydraulic Override Cylinder



Single Acting with Manual Override

## Anatomy of Limitorque Fluid Power Systems Actuators





**Slider Block:** bronze construction with optimized surface areas for long life, minimal wear, and increased efficiency

**Yoke Pin:** high-strength materials designed for maximum torque transfer while minimizing wear and localized stresses

**Guide Block:** “the heart of the system” provides directional alignment for the linear forces, transfer of side loads to the guide bar, and transfer of torque to the yoke

**Yoke:** straight or canted configurations, maximum valve-bore design, closed yoke slot for rigidity and high-cycle operation

**Cylinder:** honed and polished with either ENP or chrome linings available in a range of thicknesses

**Stop Bolt:** end-mounted to eliminate asymmetrical loading of the yoke, maximize MAWP, and simplify quick exhaust configurations

**Spring Adaptor:** ensures modularity and interchangeability of components

**Center Body:** compact carbon steel construction, designed for maximum rigidity and torque transfer, designed to accommodate controls systems and supplemental devices to maintain valve alignment, meets ISO 5211 mounting configurations

**Cylinder Adaptor:** honed and polished with either ENP or chrome linings available in a range of thicknesses

**Piston Rod:** machined and plated to minimize corrosion and friction, “push design” to simplify override installation and quick exhaust configuration

**Split Collar:** high-strength materials designed for maximum force transfer while minimizing localized stresses

**Piston:** provided with independent seals and wear rings to minimize wear and potential leakage

## Control System Options

Limatorque Fluid Power Systems offers a selection of standardized controls packages for most applications to fill customers' needs for short lead-time, low-cost solutions.

- Filter (Aluminum and 316 Stainless Steel)
- Pressure reducer (Aluminum and 316 Stainless Steel)
- Filter/regulator (Aluminum and 316 Stainless Steel)
- Relief valve for tank and regulator (Brass and 316 Stainless Steel)
- Check valve (316 Stainless Steel)
- Flow regulator valve (Aluminum and 316 Stainless Steel)
- Quick exhaust valve (Brass and 316 Stainless Steel)
- Three-way and four-way pneumatic valves (Aluminum and 316 Stainless Steel)
- Pneumatic valves mechanical/manual operated (Aluminum and 316 Stainless Steel)
- Pneumatic piloted valves (Aluminum and 316 Stainless Steel)
- Booster (Aluminum and 316 Stainless Steel)
- Pneumatic positioner for PCT
- Pneumatic positioner for regulation
- Electric pressure switch
- Solenoid valves (Brass, Aluminum and 316 Stainless Steel)

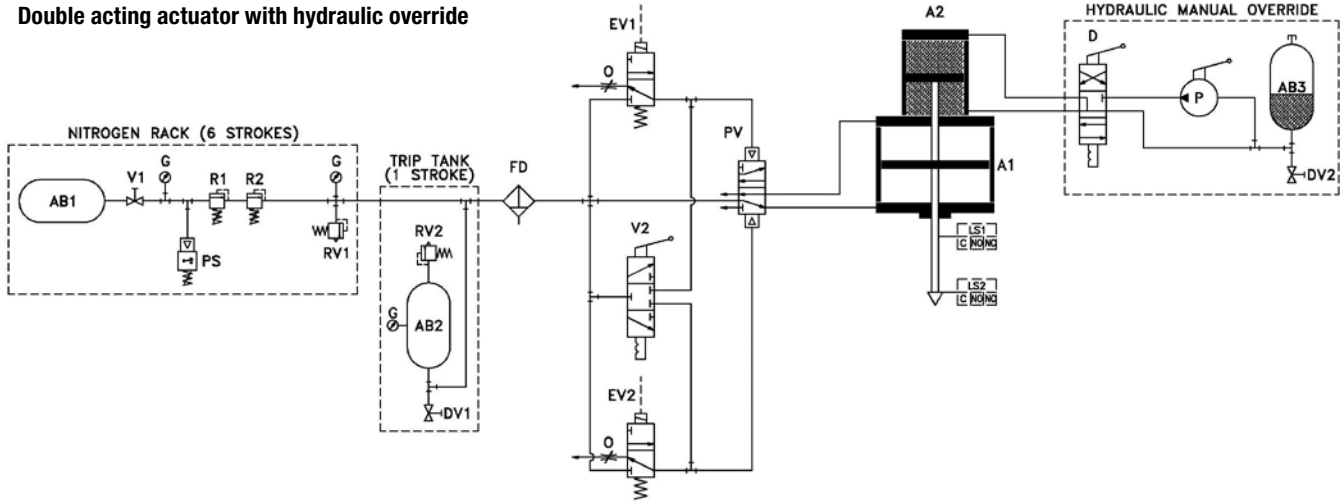
Custom control packages are also available for the most demanding applications.

- Line Break
- PST
- ESD
- Quick-closing
- Modulating/CV functionality
- Quick exhaust valve with flow regulator for closed loop (1/4", 1/2", 1" size, AL and 316 SS)
- Cylinder integral quick exhaust valve (double acting fast actuator)
- Pneumatic booster (1/4", 1/2", 1" size, AL and 316 SS)
- 3/2 and 5/2 pneumatic piloted valve with manual reset and override (1/4", 1/2", 1" size, AL and 316 SS)
- Unidirectional and bidirectional flow regulator valve (1/4", 1/2", 1" size, AL and 316 SS)
- Compact fittings to reduce pipe and control dimensions (1/4", 1/2", 1" size, AL and 316 SS)
- SIL 3 Compliant, with SFF >95%
- -60°C to +160°C temperature qualification

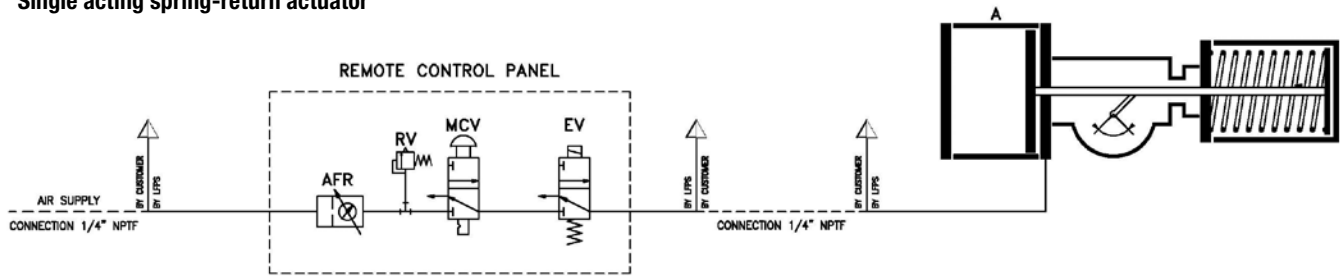
## Control Schematics

Sample schematics of control systems typically offered by Limitorque Fluid Power Systems.

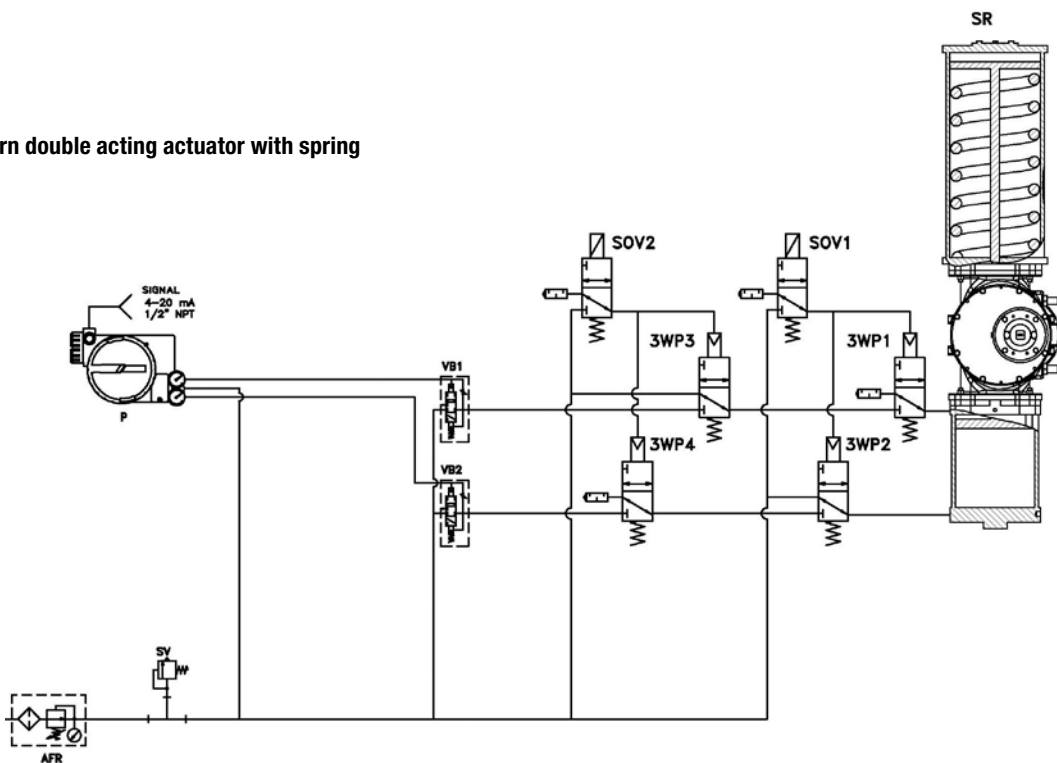
**Double acting actuator with hydraulic override**



**Single acting spring-return actuator**



**Quarter-turn double acting actuator with spring**





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