

# INFINITY ACTUATORS DRS SERIES

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The **3x** Factor

**ROTEX DRS Series Scotch Yoke Actuators**



**ATEX**

**CE**

**P.E.D.**



**ROTEX**  
INFINITY ACTUATORS

## The **3X** Factor - *BEST IN CLASS*

The Rotex tradition of excellence continues with the introduction of :  
**ROTEX DRS Series Scotch Yoke Actuators**

### Three Exclusive Features

#### Modularity

- Three parts – frame, spring, and air cylinder – modifications are simple and quick!
- Welded spring modules, for complete safety.
- Springs or cylinders can be removed from frame module without disassembling the frame module.
- Conversion from spring return to double acting is EASY!

#### Versatility

- Optional hydraulic override can be included or added later.
- Converting from fail closed to fail open is easily done in the field.
- Extra heavy duty travel adjustment bolts offer +/- 10% adjustment; for high speed impacts, no special end stops required.

#### Reliability

- Guaranteed for 1 million cycles!
- Exclusive X-Seals on pistons and V-Seals on the shafts out perform standard O-rings.
- Yoke is supported by life time lubricated ball bearings.
- Oversized dual tie rods are internal to the cylinder to eliminate corrosion.
- Tie rods pass through the pistons through solid bearings, X-seals not conventional O-rings - better alignment, lower friction, and smoother operation.
- Yoke thrust pin is case hardened for higher output torques.

## Actuator Modules

Rotex actuator spring modules and pneumatic modules can be removed, swapped, rebuilt, or reinstalled on the frame module without disassembling the frame module. No need even to remove top cover of frame module, because all bolting for removal of the modules is external.

Actuators can easily be changed in the field from fail close to fail open by just swapping the positions of the spring and pneumatic modules. No need to dismantle the frame cover or cylinder assembly.

Actuators can be modified from double acting to spring return easily in the field by adding a spring module.

Springs are lifetime lubricated and epoxy coated.

Springs are pre-compressed inside their welded spring modules for safety and ease of use.

Pneumatic cylinders are lined with hard chrome plating. Smooth to eliminate wear of piston seals, the surface is very hard, for long life.

Inside the pneumatic module, dual oversized tie rods are protected from external corrosion. Where the tie rods pass through the piston head, Rotex has improved the design by providing a slide bearing, where most designs don't. This bearing is important to help maintain alignment and assure smooth operation.

## Frame Module

Inside the frame module, the yoke is supported by life time lubricated bearings. Needle roller bearings ensure the most efficient torque transmission.

Extra heavy duty travel adjustment bolts allow for +/- 10% adjustment of the 90 degree stroke. The area of contact is large, to withstand the impact forces.

The yoke thrust pin is made of case hardened steel to resist wear.

The piston shaft is supported on each side of the frame module by solid bearings that ensure proper alignment and smooth operation.

## Flexijoint

Each piston shaft of the Rotex DRS is equipped with two Flexijoints. These specially designed joints compensate for movement and changes in alignment to reduce internal stresses and increase output torque.

The thrust transmitted through the Flexijoints ensures no side thrust on the cylinder walls and bearings.

## Unique Sealing Features

Piston seal is Rotex X design. Flexibility of the sealing material reduces friction, prevents leakage, and extends actuator life. The X shaped seal is wear compensating, and the unique shape of the seal retains the grease for longer periods. The piston is guided by a PTFE thrust bearing, which helps keep the piston centered, and seal wear to a minimum.

The tie rod seal is also of the Rotex X design. Old fashioned O-rings are replaced by these flexible, low friction, resilient seals to reduce the failure rate of tie rod seals. Also reduces the wear and tear to the tie rods themselves.

Rotex has also replaced the standard O-ring of the shaft seal. In this position, we provide a proven V-seal design. This self-energized, wear compensating seal guarantees low hysteresis and minimum friction. Like the X seal of the piston and tie rod seals, the inherent shape of the V-seal helps keep the grease where it needs to be.

## Optional Hydraulic Override

Rotex DRS actuators may be ordered with an optional hydraulic override, or the override may be retrofitted to an existing actuator.

The override is fitted into the spring cartridge, to keep the overall dimensions of the actuator and override to a minimum.

Can withstand up to 2,000 psi hydraulic pressure.

Easy to operate.

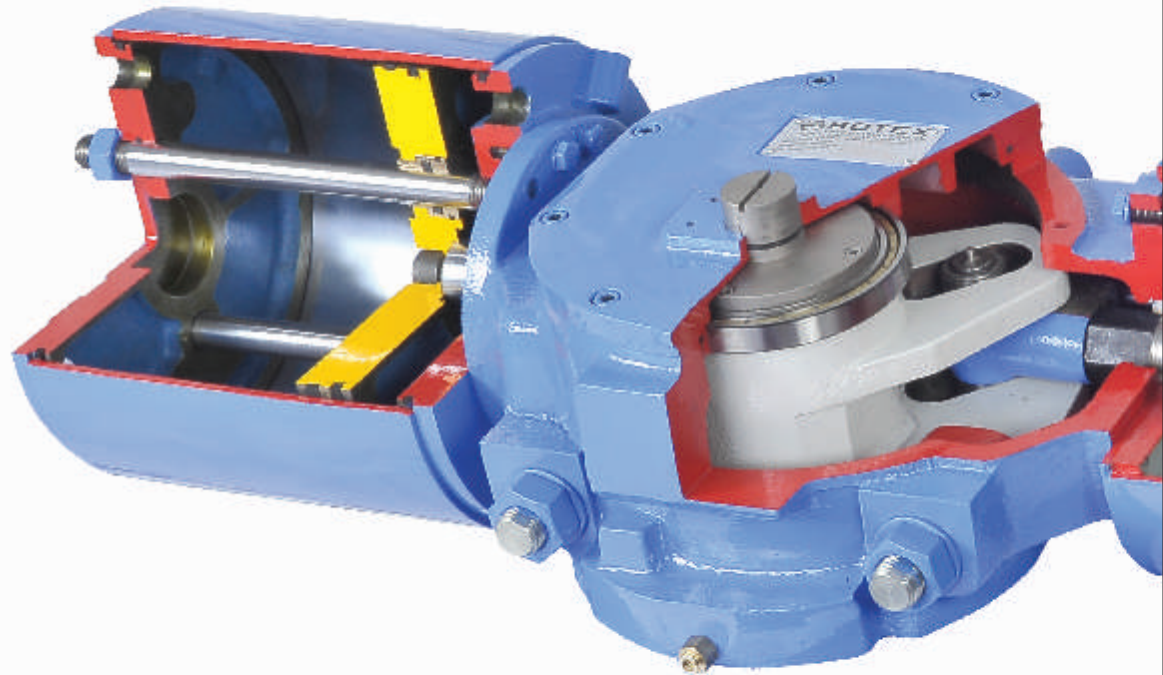
Special Z seal ensures zero leakage and extended life.

**Conclusion :** Most actuators are perfectly good. Some are better than others...  
... but the Rotex DRS is ***Best In Class!***

# Heavy Duty Scotch Yoke Actuators

## FEATURES

- X seals and V seal for low wear and tear, each with grease retaining groove
- Extra heavy duty travel adjustment bolts can withstand high impact and are easy to adjust
- Needle roller bearing provides for the most efficient torque transmission
- The actuator can easily be converted to fail open from fail close, by interchanging the spring and pneumatic modules
- No need to dismantle the frame cover to install/ change spring or air module
- The spring is well caged in the cartridge form
- The pneumatic cylinders are lined with hard chrome plating - smooth to eliminate wear of piston seals for long life



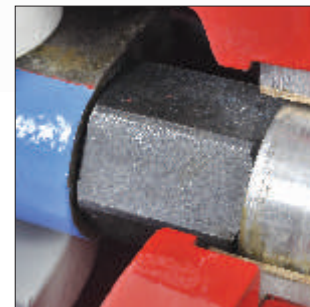
## PISTON SEAL AND GUIDE

- The piston is guided by PTFE thrust bearing, to ensure no metal to metal contact
- The seal is X shape with flexibility, to minimize the friction
- The seal flexibility ensures no leakage and very long life
- Due to inherent shape, it retains the grease for a longer period
- Guaranteed operation of 1 million cycles



## YOKE PIN THRUST BEARING

- The carrier is well guided on the support rod
- Case hardened steel of the yoke thrust pin is strong for consistent transmission of the force
- Grease nipple for lubrication
- Larger intervals between scheduled maintenance



## FLEXI JOINT

- The thrust transmitted through the Flexi joint ensures no side thrust on the cylinder walls and the bearings
- The Flexi joint provides an easy means to assemble/ dismantle the cylinder module to the frame
- In spring return actuators, dual Flexi joints allow the carrier to operate perfectly and smoothly



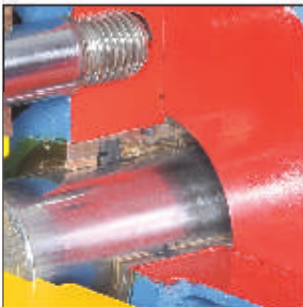
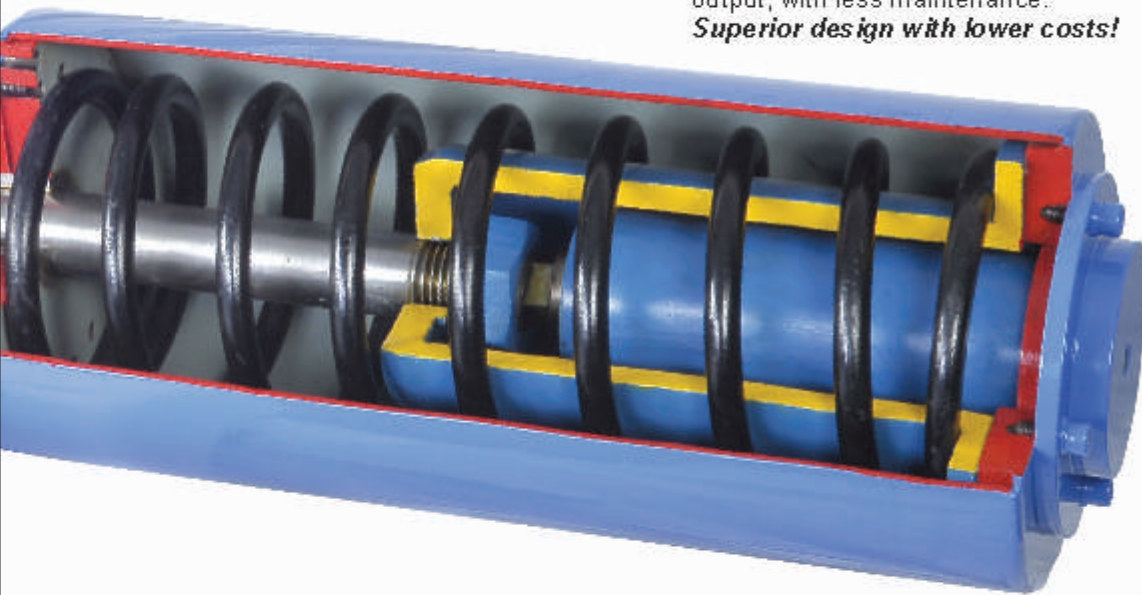
# Heavy Duty Scotch Yoke Actuators

- Solid bearing for piston rod for better alignment and smooth operation
- Internally mounted hydraulic override
- Guided, lifetime lubricated epoxy coated springs
- The tie rods are enclosed in the cylinder for the best performance, for high corrosion protection, and a longer life of the actuator
- The hydraulic override is built into the spring carrier
- Can be installed at a later date
- The vent valve is provided to check the gland leak on the direct mount valves
- The vent valve has built non return function, for IP67
- Secondary vent valve function is to detect leakages in the rod seal area of pneumatic cylinder

## **SUPER EFFICIENT!**

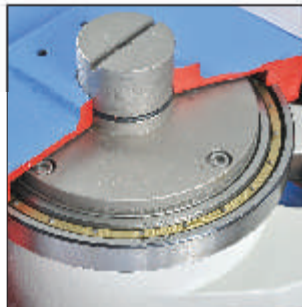
Needle bearings, Flexi joint, and the hardened yoke thrust pin bearing, are all incorporated into the actuator for longer, smoother operation. The Rotex DRS actuator gives you greater efficiency and higher torque output, with less maintenance.

*Superior design with lower costs!*



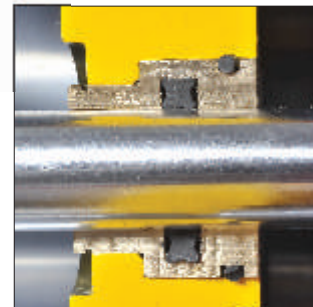
### **HEAVY DUTY BEARINGS**

- The piston rod is guided on the heavy duty bearing
- V - Seal at the rod end ensures a very long life
- The bearing is built with a high grade bronze metal
- Low friction for smooth operation



### **YOKE BEARING**

- The yoke is supported on life time lubricated ball bearings
- Very low coefficient of friction
- Provides 98% of the torque transmission
- Wear and tear of the yoke is reduced due to the alignment and support provided by the bearings



### **X SEAL ON TIE ROD**

- The X seal provides the flexibility in sealing
- Due to additional linear bearings, the tie rod is not under wear and tear
- The X seal provides extremely low friction and a long life

## SCOTCH YOKE

- Conventional system
- Excellent for valves having break torque much higher than run torques
- Comparatively, less cyclic load
- Light weight
- Requires only periodic servicing
- Cost effective

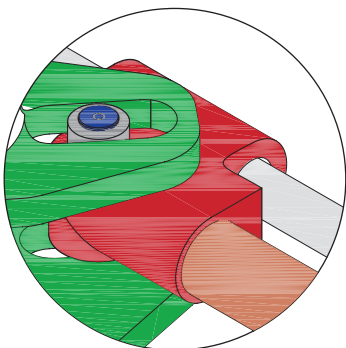
## LOW FRICTION PISTON SEAL

Flexible X style seal seals the piston to the cylinder wall. Hard chrome plated cylinder ensures a smooth surface for the piston seal to glide along. Chrome will resist flaking or peeling, ensuring a long lasting smooth surface

## SPRING INSPECTION

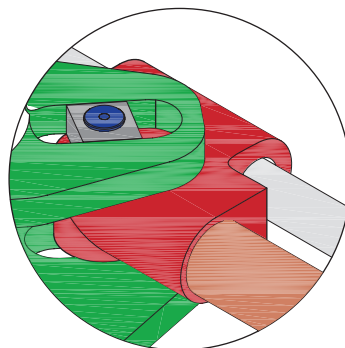
The spring pack can be easily removed from the actuator for the inspection. In most critical shut down applications it is a requirement that springs are periodically checked for cracks, low set and buckling to verify the health of the spring. ROTEX High Performance Actuator provides this feature to allow our customers to run their plants smoothly.

## PRINCIPLE OF SCOTCH YOKE



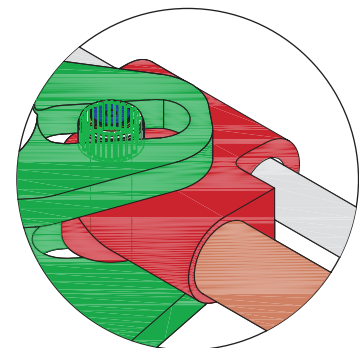
**MAKE 'B'**

- The roller is directly mounted on pin
- High friction
- Low efficiency of transmission
- Line contact for load transmission



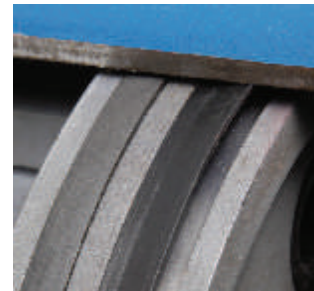
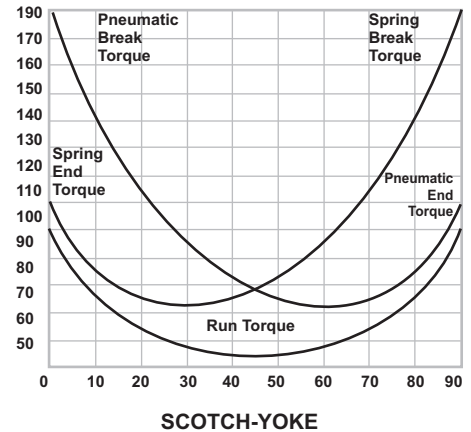
**MAKE 'R'**

- Square drive is mounted on pin
- Larger friction
- Lower efficiency of transmission
- Larger face contact for load transmission



**ROTEX**

- Roller is mounted on a needle roller bearing
- Very low friction
- Very high efficiency of transmission
- Line contact for the load transmission



**LOW FRICTION LIP SEAL**