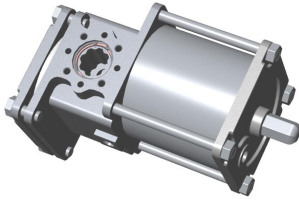


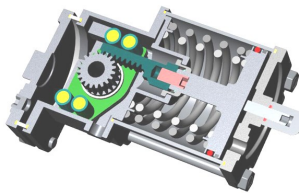
INSTALLATION & OPERATING INSTRUCTIONS

Installation:

- Q Series spring return actuators locate the springs inward of the pistons so that the pistons are forced outward by the action of the springs. Application of supply pressure to the end cap ports (one on Q04SR, two on Q05SR) pushes the pistons inward.



QB04SR



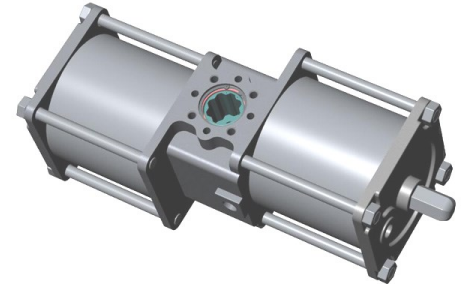
- The body port on Q Series spring return actuators is used only for 'breathing', i.e. to allow air to flow into and out of the body as the pistons move within the assembly.

- Refer to separate dimensional drawings for mounting dimensions when designing any required mounting bracketry

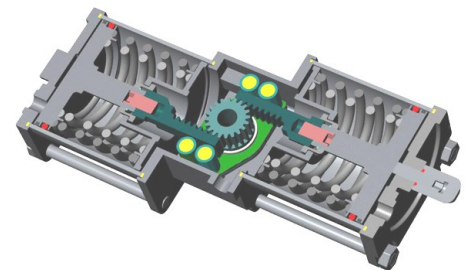
- Q Series actuators may be mounted in any plane
- Both sides of the Q Series actuators are provided with identical female double square drive geometries and either (or both) may be used to drive the valve—however the shaft on one side will rotate clockwise, and the other counter-clockwise when the spring expands. This allows convenient changes to the operating assembly—from fail closed to fail open—by simply turning the actuator so that

the opposite side is used to drive the valve.

- When shipped, unless specified otherwise, QTRCO will mount a NAMUR Top Hat (Provides a standard 20mm tall male shaft drive with NAMUR slot) in the shaft side which corresponds to Fail Closed operation. This Top Hat can be relocated by the user to the other end of the shaft for Fail Open operation. Both sides of the actuator body are drilled and tapped with 30mm x 80mm M5 bolt patterns conforming to NAMUR #1 standard dimensions
- Outward piston travel adjustment for both Q04SR and Q05SR actuators (maximum 5 degrees over-travel) is via removal of the travel stop covers on each cylinder which exposes a large diameter set screw. Backing out the set screws allows added travel of the pistons and shaft.
- Inward travel adjustment on the Q04SR is via an optional travel stop located in the short side end cap. This stop sets the amount of inward travel of the piston. The Q05SR does not offer travel adjustment for the inward piston travel—recall however that outward travel is generally the closing direction so that it is very easy to adjust the valve's closing position.
- Piping is as shown in the figures below. It is not necessary to apply pressure to the body port. While designed and built with shaft seals, not pressurizing the body allows infinite cycles with no possibility of shaft seal leakage—because they are not placed under pressure.



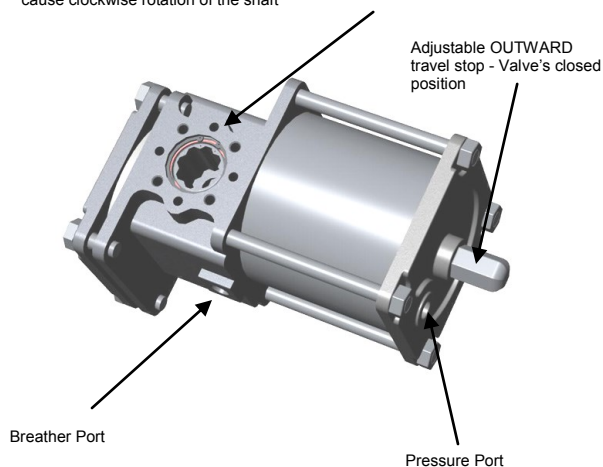
QB05SR



Looking down onto this view, the springs push the pistons outward and cause clockwise rotation of the shaft

Duplicate double square shaft and mounting on both faces

Looking down onto this view, the springs push the pistons outward and cause clockwise rotation of the shaft

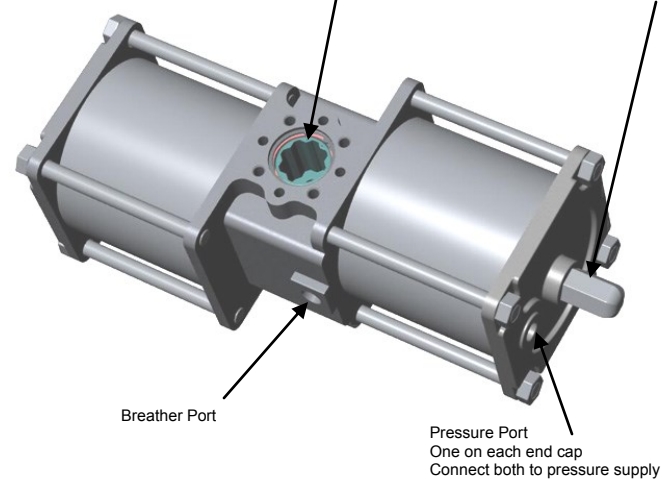


Breather Port

Pressure Port

Duplicate double square shaft and mounting on both faces

Adjustable OUTWARD travel stop - Valve's closed position



Breather Port

Pressure Port
One on each end cap
Connect both to pressure supply



MAINTENANCE

Under normal conditions, the Q04SR and Q05SR series actuators require little maintenance. The unique design of the Rack & Gear actuators contains the applied pressure between the end of the cylinder and the piston, making the piston o-ring the only dynamic seal. Shaft o-ring wear is of little consequence as leakage will not occur due to there being no pressure on these seals.

Piston o-ring replacement

- Before working on these or any actuator, **REMOVE ALL PRESSURE**. For added safety, **DISCONNECT THE PRESSURE LINES** from the actuator. In this condition, the Q04SR and Q05SR actuators will return to their 'failed' position with the springs having pushed the pistons outward against the outer travel stops.
- Unique to the QTRCO SR actuators, springs are located inward of the pistons, making piston o-rings accessible by removal of the cylinders.
- Note that this procedure may be accomplished with the actuator yet mounted on the valve and while remaining in the piping. It is not necessary to remove any accessories—thereby saving considerable time and labor costs. The valve will be held in the 'failure' position by the springs.
- **Q05SR - With all pressure and supply pressure piping disconnected from the actuator**, remove the travel stop covers from the end portion of one of the cylinders. Note the extended length of the travel stop set screw. Using a hex drive wrench (Allen wrench) unscrew the travel stop screw until there is no resistance to rotation. It is acceptable, but not necessary to back these screws completely out of the cylinder. The o-ring seal will remain on the screw and is required to prevent pressure media leakage from these threads. The original o-ring is reusable as the mild compression load does not cause deformation. Following replacement of the piston o-ring on the first end, repeat the procedure for the other end.
- **Q04SR - With all pressure and supply pressure piping disconnected from the actuator**, remove the travel stop cover from the end portion of the cylinder. Note the extended length of the travel stop set screw. Using a hex drive wrench (Allen wrench) unscrew the travel stop screw until there is no resistance to rotation - the point at which it is no longer in contact with the piston. It is acceptable, but not necessary to back this screw completely out of the cylinder. The o-ring seal will remain on the screw and is required to prevent pressure media leakage from these threads. The original o-ring is reusable as the mild compression load does not cause deformation.
- Again, with all pressure and piping removed, remove the four hex nuts which secure the end cap and cylinder to the body.
- Slide the end cap off of the tie rods (tie rods may be removed or allowed to remain in place) followed by sliding the cylinder off from the assembly—the piston o-ring is now exposed. *(For the Q05SR, complete this on one cylinder at a time as having the second cylinder in place will assist with maintaining the position of the cylinder being worked on)*
- Remove and replace the piston o-ring.
- Clean the cylinder bore and the piston o-ring groove using a clean cloth to remove all old lubricant.
- Visibly check the cylinder bore for contaminant caused scratches. Light scratches can be removed via rubbing with an abrasive pad. If badly damaged, the cylinder may be replaced - unlike other designs which require discarding the entire actuator.
- Assure that the cylinder bore is clean. Re-lubricate with an o-ring compatible grease (provided with a QTRCO spare parts kit).
- Slide the cylinder into place while assuring that it seats firmly into the body face seal groove.
- Replace the end cap, again assuring engagement of the cylinder into the end cap seal groove.
- Refasten the cylinder hex nuts. Tighten diagonally to 20 pound feet of torque.
- Re-install the travel stop screw until they contact the piston, then tighten until the exposed height is the same as prior to disassembly. Due to the strength of the springs, it may not be practical to use the screws alone to adjust the stop point. If too difficult, use media supply pressure to stroke the actuator, adjust the screws, relieve the pressure, check stroke, repeat if necessary. Install the travel stop cover.
- Reattach tubing.—this step may precede the above step if desired. Apply supply pressure as necessary to assist with stroke adjustment.
- When stroke is as desired, return to service.

