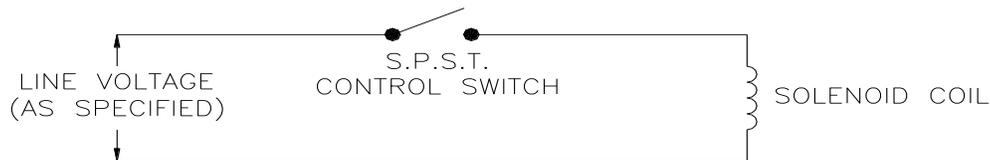


TYPE MD & MS FIELD INSTALLATION INSTRUCTIONS

INSTALLATION

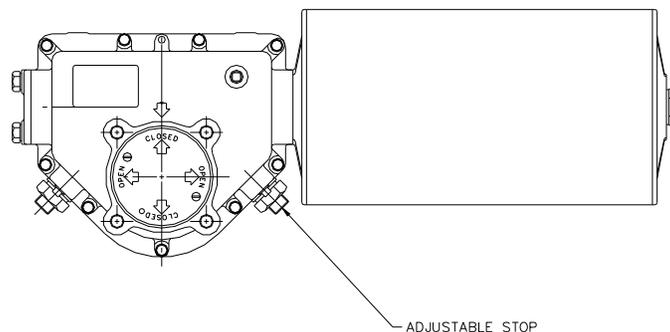
1. Operate valve manually before installing actuator and place into open position.
2. If valve is equipped with mechanical position stops they should be removed, but care should be taken not to damage or remove necessary parts from the valve.
3. When actuator is supplied separately from valve, actuator will be shipped in valve open position and care should be taken to maintain proper alignment between the actuator and valve shafts. If actuator and valve shafts are not in correct alignment repeat operation number one (1) with correction as required.
4. Install the stem adapter bushing (if furnished loose) on the valve stem and install the actuator over the bushing. The actuator is usually mounted parallel to the run of the pipe. Tighten all bolts and nuts evenly, taking care to center the actuator on the valve stem. It is often a good idea to cycle the actuator while the mounting bolts are somewhat loose. This will allow the unit to center itself.
5. Install and wire solenoid (if required) per diagram below or special wiring diagram with solenoid. 20 gauge stranded wire or better, should be used in field hook up.



Note: Standard operation for all Pneumatic/hydraulic actuators supplied with **factory mounted solenoid valves** is: clockwise rotation from open position to close position when solenoid is de-energized and counterclockwise rotation from close position to open position when solenoid is energized.

6. Operate actuator from one extreme to the other several times and check valve positions. When the actuator is first put into service, slight leakage past the piston cups and other seals may be detected. This is due to the packing having been held in one position, tending to cause a hard seal. In such cases, the actuator should be operated through several cycles, thereby flexing the seals into normal operation.

TO ADJUST OPEN AND CLOSE VALVE POSITIONS (IF REQUIRED)



All models are equipped with externally adjustable stops to adjust individually the opening and closing strokes. These adjustable stops are necessary to compensate for the manufacturing tolerances of both the valve manufacturer and the actuator manufacturer.



ADJUST OPEN AND CLOSE VALVE POSITIONS (CON'T.)

1. Loosen locknuts on the position adjustment screws.
2. To adjust for correct positioning, rotate position adjustment screws clockwise (into housing) for over traveling condition or counterclockwise (out of housing) for under traveling condition. This procedure is typical for adjusting both open and close positions.
3. Tighten locknuts on position adjustment screws and operate unit to check corrected positions. If further corrections are needed, repeat steps 1, 2, and 3.

MAINTENANCE

Clean, dry air or gas is essential for long service life and satisfactory operation. If instrument air of this quality is not available, it is recommended that an inline filter be provided to prevent foreign particles from entering the cylinders of the actuator. Under most normal circumstances the actuator does not require additional lubrication, it should be remembered that most control valves and solenoids (with the exception of positioners) perform better on lubricated air. For this reason, an airline lubricator may be installed. Care should be taken to use only lubricants compatible with the seal in the actuator and control valves.

The actuator is constructed with an adequately greased body section, this lubricant need never be changed. However, through disassembly, etc., should it become necessary to refill, we recommended use of Exxon Beacon P290 for -40°F to +150°F or Exxon Beacon 325 for -65°F to +200°F ambient temperatures. Due to the piston rod displacement, the unit should be filled with the actuator in the full open position. If filled otherwise, no damage will occur when the actuator is operated, but the excess lubricant will be forced out the breather cap.

HYDRAULIC SERVICE

All models of the actuator can be furnished for using hydraulic fluid as an operating medium. When using water or other corrosive fluids as the operating medium, plating and coatings compatible with the respective operating medium, must be used.

STORAGE

Indoor storage, if available is recommended for all actuators. Care should be taken to plug the cylinder ports, control valve ports and the body ports. Also, actuators should not be stored in an atmosphere harmful to resilient seals.

The piston(s) and other seals used in the Actuator are Buna-N material. Such synthetic materials have a shelf life of approximately 12 months at which point they go "dead". In normal use the life of these seals is indefinite, depending upon the amount of lubrication, etc. However, if the actuator sits for extended periods of non-use, the packing will have a tendency of going dead. In such cases, when the actuator is called on to operate, leakage by the piston(s) will be experienced. The actuator in most cases will stroke the valve but then the gas will leak from the exhaust of the control valve. To prevent this from occurring we recommend that the actuator be cycled several times on at least 90 day intervals. This will keep the seals and piston(s) "alive" and flexible.



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CYLINDER DISASSEMBLY

Safety First

In the maintenance and operation of mechanical equipment, SAFETY is the basic factor with must be considered at all times. Through the use of the proper clothes, tools and methods of handling, serious accidents causing injury to you or your fellow worker can be prevented.

Throughout this manual are listed a number of safety precautions. Study them carefully and follow them; also insist upon those working for you to do the same. Remember, an accident is usually caused by someone's carelessness, neglect, or oversight.

Type MD

Double Acting (Air To Air) Units:

 CAUTION	Remove all operating media pressure from actuator and turn actuator/valve into a position that will not cause actuator to be back turned due to turbulence in the valve or remove actuator from valve before any disassembly.	 CAUTION
--	---	--

Lock Ring Models

At the base of the cylinder is a slot containing the cylinder retaining lock ring. This slot has been filled with sealant and painted over. With a screwdriver, knife, etc., remove the sealant. This will reveal a small socket head cap screw. Remove the cap screw. With the aid of a strap wrench, rotate cylinder counterclockwise. This will force the cylinder retaining lock ring out of the groove between the cylinder and cylinder adapter. Remove cylinder retaining lock ring and pull cylinder away from cylinder adapter until the groove for the lock ring contacts the "O" ring. At this point, use a screwdriver to push the "O" ring down so that the cylinder can be removed. (In some cases, the "O" ring may have to be cut in two.) Remove cylinder.

Tie Rod Models

Alternately loosen, a little at a time, two tie rod nuts across from each other. Similarly, loosen the remaining nuts and remove by hand. Care should be taken when removing the last two nuts as end cap and cylinder will become free to drop or fall.

Type MS (SINGLE CYLINDER UNITS ONLY)*

Spring Return (Air To Spring) Units:

 CAUTION	Spring inside cylinder under compression. Remove all operating media pressure from actuator, manually turn or allow unit to run into normal (spring return) position and check that actuator can not be back turned due to turbulence in the valve or remove actuator from valve before any disassembly.	 CAUTION
--	--	--

Proceed to remove cylinder the same as with MD units.

CYLINDER RE-ASSEMBLY

Lock Ring Models

Replace cylinder "O" ring (if required) and carefully slide cylinder over piston and up to adaptor. Using a screwdriver, push the "O" ring down and slide cylinder on to adaptor. Place lock ring tab through cylinder slot and into tab hole. With a strap wrench, rotate cylinder clockwise which will feed the cylinder retaining lock ring into the groove between the cylinder and cylinder adaptor. Replace the cap screw and fill slot with sealant.

Tie Rod Models

Be sure that cylinder adaptor, cylinder, end cap and tie rods are fully in alignment and solidly together. Install tie rod nuts and tighten snugly by hand. Use a torque wrench and alternately tighten, a little at a time, two tie rod nuts across from each other. Tighten to full torque given in table. Similarly, tighten the remaining nuts. Alternately check to bring all nuts up to full torque.

If a torque wrench is not available, use the same method given above and a hand wrench with an extension. Divide the torque shown in the table by the distance in feet from the nut to the point where pressure is being applied to the wrench. This gives the force (pounds) required for tightening.

Tie Rod Table – All Models
Recommended Torque (Ft. Lbs.)

DRY		LUBRICATED	
135	+00 - 10	100	+0 - 5

Applied torque shall be measured only in the tightening direction. If a nut is overtorqued, it shall be loosened and retightened to the specified value.

* CONSULT FACTORY FOR DISASSEMBLY INSTRUCTIONS ON TANDEM UNITS – DO NOT ATTEMPT DISASSEMBLY.