

OPERATION AND SERVICE MANUAL

for

TESCOM

Piston Sensed Pressure Reducing Regulators

General

TESCOM's piston sensed pressure reducing regulators are specifically engineered for applications requiring dependable pressure regulation. These regulators are especially appropriate for installations where high system pressures (up to 20,000 psi) must be reduced to levels suitable for actuating low pressure (0 to 20,000 psi) instruments and related equipment.

Pressure Activation Methods

TESCOM uses three basic types of activation methods. The activation method provides the means by which the operator can set the force that determines the outlet pressure of a regulator

Control Knob: Delivery pressure is increased by turning the control knob. The control knob applies a load through a spring to the piston.

Dome Load: Delivery pressure is increased by applying pressurized gas or liquid to the dome of a regulator at a pressure equal to the outlet pressure desired. This dome pressure is normally provided by a second regulator called the pilot regulator.

Combination Spring and Dome: Delivery pressure is increased by applying a spring force as well as the introduction of pressurized gas or liquid.

Air Actuated (Multiplier): Delivery pressure is controlled by applying 0-100 PSIG pilot pressure to the air actuator, resulting in full outlet pressure range control.

Materials of Construction

Standard materials of construction contacting the fluid media can be any of the following:

Regulator Body: 300 Series SST, Brass, Hastelloy®, Monel®, Aluminum
Seats: Teflon®, CTFE, Vespel®, Peek®, Soft Goods (O-rings & back-up Rings) Teflon®, BUNA-N, Viton A®

Trim: 300 Series SST, Brass, Hastelloy, Monel, Aluminum

The official material of construction and pressure activation method for your pressure reducing regulator depends on series number and modification ordered.

Operation (Control Knob Adjustment)

Controlled outlet pressure settings are obtained using TESCOM pressure reducing regulators by adjusting the control knob. Rotating the knob clockwise raises the outlet pressure while a counterclockwise rotation, coupled with venting of the downstream side of the regulator plumbing, lowers the outlet pressure. Final adjustments should be made in the direction of increasing pressure to obtain the most accurate set point.

TESCOM regulators will operate with any liquid or gaseous media compatible with the wetted materials. Some series/modifications come with an internal filter that only are designed to stop random contamination resulting from the installation of the regulator. An auxiliary upstream filter is recommended for use in all but the cleanest media. Gaseous media should be free of excessive moisture to prevent icing of the regulator at high flow rates.



WARNING A REGULATOR IS NOT INTENDED TO BE USED AS A SHUTOFF DEVICE. WHEN THE REGULATOR IS NOT IN USE, THE INLET SUPPLY SHOULD BE TURNED OFF. AS A SAFETY PRECAUTION, A PRESSURE RELIEF DEVICE SHOULD BE INSTALLED DOWNSTREAM OF THE REGULATOR.

Maintenance

The following procedures are provided to enable the customer to perform all normal maintenance and repair operations. These operations are more easily performed with the regulator removed from the line. However, in some cases repair may be accomplished without removal of the regulator body as long as the supply has been shut off and the inlet and outlet pressures have been vented.

The following steps outline the disassembly of pressure reducing regulators for maintenance and repair. Up-to-date assembly drawings and bills of material are available from the factory.

1. Clamp the regulator in a vise by the flats on the bottom and/or side of the regulator body.
2. Turn control knob and/or spring adjustment mechanism counterclockwise to insure removal of all spring force on the piston.

NOTE (Dome loaded regulators): All pressurized gas or liquid must be vented from dome before disassembly.

3. Remove upper portion of regulator (bonnet and/or dome). Some models require the handknob and/or mounting bracket to be removed first.

NOTE: Upper portion of regulator may also include spring button, load spring back-up plate, and piston sensor, etc. Review correct drawing to ensure that all parts have been disassembled.

NOTE: (Two-Stage Regulator) TESCOM Model Series BB-5 is a two-stage regulator that has portions on both ends of the regulator body that must be removed. It is TESCOM's recommendation that two-stage regulators be returned to the factory for repair.

Maintenance (continued)

4. The valve parts can now be removed from the regulator body by turning the seat retainer and/or back cap counterclockwise until it is free of the regulator body.



WARNING TESCOM MODELS 26-1000 AND 44-1100 VALVE PARTS ARE HELD IN PLACE BY THE USE OF LEFT-HANDED THREADS.

NOTE: If necessary, valve seat may be removed from the seat retainer using a sharp instrument.

CAUTION: When removing valve parts from a regulator that has a back cap, care must be taken to insure the main valve stem remains vertical. If the main valve stem is not removed correctly, parts may remain in the regulator.

5. To disassemble main valve assembly and/or valve, clamp valve in smoothed jaw vice or hold with pliers. Clamping should be done on flats.

CAUTION: Care must be used to not damage valve. A special fixture may be ordered from the factory to aid in the disassembly of the main valve assembly found in TESCOM Regulator Models 26-1000 and 44-1100.

NOTE: Several of TESCOM's regulators are supplied with internal filters. They will be located either in the inlet port or in the main valve area of the regulator. In each case, they should be removed and replaced before reassembly.

Reassembly

The regulator is reassembled in the reverse order of disassembly, observing the following precautions. Please reference the Bill of Material and assembly drawing for the correct location of replacement parts and correct torque specifications.

Reassembly (continued)

1. Inspect all parts and replace those worn or damaged with TESCO replacement parts.
2. All parts should be cleaned to the cleanliness level required for safe operation with the media and system they will be used in. All parts in the flow stream must be free of particles which could prevent proper seating of the main valve.
3. Apply a thin uniform coating of fluorocarbon grease to any or all of the following parts: indentation of spring button, threaded portion of adjusting screw, entire threaded area of the bonnet, all O-rings, all threaded parts internal to regulator.
NOTE: Do NOT apply any type of grease to the inlet or outlet connections.
4. Valve seats must be installed with the chamfered side towards the main valve.
5. Standard Regulator with Control Knobs - The body and bonnet are best joined by holding the bonnet assembly open end up and dropping all required items into place one at a time. The last item to be placed in the body of most all of TESCO regulators is the piston sensor. Place all O-rings and back-up rings that are external to the piston sensor in the body before placing the sensor in place. O-rings should always be installed before back-up rings. The bonnet and body may now be attached. This is best done by holding the body in one hand and the bonnet in the other. Tilt the body at a 45° angle and then attach the bonnet by screwing it into the body firmly, hand tight. Regulator should then be placed in vise and bonnet retorqued to correct specifications. See print.

Reassembly (continued)

6. Dome/Spring Combination and Dome Loaded Regulators are more easily reassembled by holding regulator firmly in vise and reinstalling dome.
7. Self-Venting Regulator - If your regulator has an adjustable vent valve mechanism, it is set on final assembly at the factory and usually will not require further adjustment. If adjustment becomes necessary, use the following procedure after regulator has been installed:
 - Step 1. Remove hole plug located in control knob.
 - Step 2. Using control knob, apply 10 to 15 psi on downstream side.
 - Step 3. Turn vent adjusting screw CW (located under hole plug) until media can be heard escaping through vent valve.
 - Step 4. Turn screw CCW until media flow stops, plus 1/2 turn. Replace hole plug.
8. Reinstalling wire mesh inlet filter - Insert filter into primary inlet port. It must then be expanded to fit correctly. This can be accomplished by inserting a metal tool the same size as the port and then lightly tapping it with a hammer.



WARNING AFTER REGULATOR HAS BEEN REASSEMBLED, IT SHOULD BE CONNECTED TO A PRESSURE SOURCE WITH MEDIA COMPATIBLE WITH THE USE OF THE REGULATOR AND PRESSURIZED TO CHECK FOR INTERNAL AND EXTERNAL LEAKAGE AND OPERATING CHARACTERISTICS.

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