

Parker Hannifin Corporation
Veriflo Division
250 Canal Blvd.
Richmond, Ca 94804
Phone (510) 235-9590
Fax (510) 232-7396

PARKER
P4-12 Series Miniature
Actuator Bellows Valve
Maintenance Instructions
MI-131



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P/N 17000852 Rev B

SECTION 2: NORMALLY CLOSED VALVE
(P4-12AC)

For **NORMALLY CLOSED VALVES (P4-12AC)** refer to Figures 1 and 2.

2A: GASKET REPLACEMENT

DISASSEMBLY

1. Remove the Bonnet Sub-assembly by unthreading the Union Nut from the Valve Body with a 1 inch hex socket wrench.
2. Remove the Gasket from the Valve Body.

REASSEMBLY

1. Place the new Gasket in the Valve Body.
2. Lightly lubricate the Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements.
3. Preferably, pressurize the Bonnet Sub-assembly at the 10-32 UNF port in the Actuator Body to open the valve for the following step.
4. Engage the Bonnet Sub-assembly onto the Valve Body and torque the Union Nut to 50 FT-lbs. (67 N-m) maximum.

2B: STEM TIP and BELLOWS SUB-ASSEMBLY REPLACEMENT

DISASSEMBLY

1. Remove the Air Operator Cap from the Actuator Body using a 3/16 inch hex socket wrench.
2. Remove the Piston by first removing the Snap Ring from the Stem Sub-assembly.
3. Remove the Bonnet Sub-assembly by unthreading the Union Nut with a 1 inch hex socket wrench.
4. Remove the Gasket from the Valve Body.
5. Remove the Stem Sub-assembly from the Bonnet Sub-assembly.
6. Remove the Bushing and Spring from the Stem Sub-assembly.

REASSEMBLY

1. Insert the Bushing and Spring on the new Stem Sub-assembly.
2. Insert the assembly of step 1 into the Bonnet Sub-assembly. Exercise caution to prevent damage to the O-Rings.
3. Place the new Gasket into the Valve Body.
4. Lightly lubricate the Valve Body or Union Nut threads, as consistent with the Valve's service requirements. Always contact your authorized Parker representative if any questions arise.
5. Engage the Bonnet Sub-assembly onto the Valve Body finger tight.
6. Install the Piston onto the Stem Sub-assembly and secure the Piston with the Snap Ring.
7. Engage the Actuator Cap onto the Actuator Body.
8. Preferably, pressurize the Bonnet Sub-assembly at the 10-32 UNF port in the Actuator Body to open the valve for the following step.
9. Torque the Union Nut to 50 FT-lbs. (67 N-m) maximum.

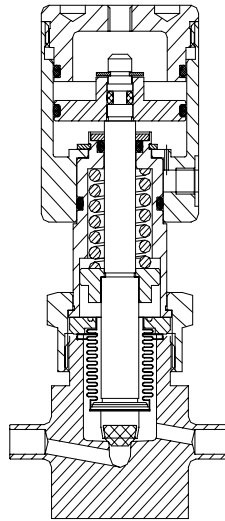


Figure 1 - Parker P4-12AC
 Normally Closed Bellows Valve
 Cross Section Assembly

WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met. The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

ALL PARKER VALVES MUST PASS A RIGID OPERATIONAL AND LEAKAGE TEST BEFORE LEAVING THE FACTORY. IT IS RECOMMENDED AFTER ANY REASSEMBLY, THE VALVE SHOULD BE TESTED BY THE USER FOR OPERATION AND LEAKAGE. IF THESE INSTRUCTIONS ARE NOT FULLY COMPLIED WITH, THE REPAIRED PRODUCT MAY FAIL AND CAUSE DAMAGE TO PROPERTY OR INJURY TO PERSONS. PARKER HANNIFIN CANNOT ASSUME RESPONSIBILITY FOR PERFORMANCE OF A CUSTOMER SERVICED VALVE.

SECTION 1: MANDATORY MAINTENANCE NOTES
 THESE NOTES AND INSTRUCTIONS MUST BE PRECISELY FOLLOWED FOR ANY MAINTENANCE OF PARKER P-SERIES BELLOWS VALVES.

DISASSEMBLY OF BELLOWS VALVES:

1. **WARNING: MAKE CERTAIN THE SYSTEM IN WHICH THE VALVE IS INSTALLED IS DRAINED AND/OR EXHAUSTED OF ALL PRESSURE BEFORE STARTING VALVE REMOVAL OR DISASSEMBLY. FAILURE TO DO SO CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.**
2. Verify that the Bellows Valve Maintenance Kit being used is appropriate for the Valve's size and service requirements. Always contact your authorized Parker representative if any questions arise.

REASSEMBLY OF BELLOWS VALVES:

1. Make certain all parts are free of dirt or other contamination before starting reassembly of the Valve.
2. Any instruction to lubricate any Valve component assumes the End User will select a lubricant that is consistent with the Valve's service requirements. Always contact your authorized Parker representative if any questions arise.

Table I

Maximum Allowable Working Pressure and Temperature

Bellows Valve Model	Max Allowable Working Pressure and Temperature
Air Supply Pressure	50 - 150 psig (0.3 MPa to 1.0 MPa)
Normally Open	600 psig at 70° F (4.1 MPa at 21° C)
Normally Closed	200 psig at 70° F (1.4 MPa at 21° C)
Double Acting	700 psig at 70° F (4.8 MPa at 21° C)

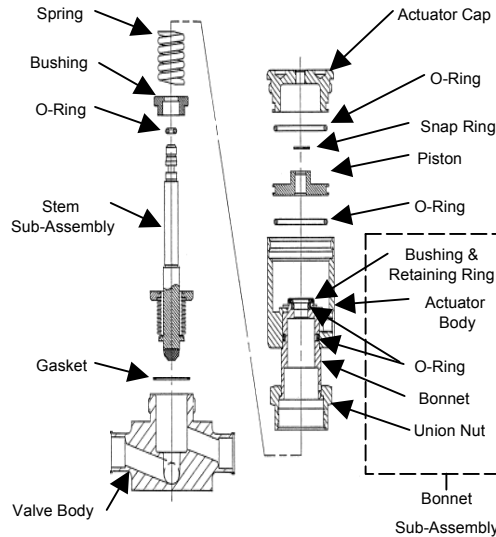


Figure 2 - Parker P4-12AC
 Normally Closed Bellows Valve
 Exploded Assembly

SECTION 3: NORMALLY OPEN VALVE (P4-12A0)

For NORMALLY OPEN VALVES (P4-12A0) refer to Figures 3 and 4.

3A: GASKET REPLACEMENT

DISASSEMBLY

1. Remove the Bonnet Sub-assembly by unthreading the Union Nut from the Valve Body with a 1 inch hex socket wrench.
2. Remove the Gasket from the Valve Body.

REASSEMBLY

1. Place the new Gasket in the Valve Body.
2. Lightly lubricate the Valve Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements.
3. Engage the Bonnet Sub-assembly onto the Valve Body and torque the Union Nut to 50 Ft-lbs. (67 N-m) maximum.

3B: STEM TIP and BELLOWS SUB-ASSEMBLY REPLACEMENT

DISASSEMBLY

1. Remove the Air Operator Cap from the Actuator Body using a 3/16 inch hex socket wrench.
2. Remove the Piston by first removing the Snap Ring from the Stem Sub-assembly.
CAUTION: EXERCISE CARE TO AVOID INJURY AND DAMAGE FROM THE COMPRESSED SPRING UNDER THE PISTON.
3. Remove the Spring from within the Actuator Body.
4. Remove the Bonnet Sub-assembly by unthreading the Union Nut with a 1 inch hex socket wrench.
5. Remove the Gasket from the Valve Body.
6. Remove the Stem Sub-assembly from the Bonnet Sub-assembly.
7. Remove the Bushing from the Stem Sub-assembly.

REASSEMBLY

1. Insert the Bushing on the new Stem Sub-assembly.
2. Insert the assembly of step 1 into the Bonnet Sub-assembly. Exercise caution to prevent damage to the O-Rings.
3. Place the new Gasket in the Valve Body
4. Lightly lubricate the Valve Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements.
5. Engage the Bonnet Sub-assembly onto the Valve Body and torque the Union Nut to 50 Ft-lbs. (67 N-m) maximum.
6. Place the Spring into the Actuator Body.
7. Install the Piston by compressing the Spring and inserting the Snap Ring onto the upper portion of the Stem Sub-Assembly.
CAUTION: EXERCISE CARE TO AVOID INJURY AND DAMAGE FROM THE COMPRESSED SPRING UNDER THE PISTON.
8. Install the Actuator Cap onto the Actuator Body.

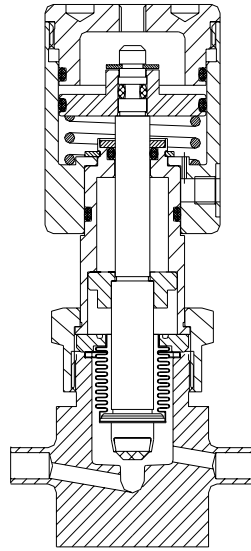


Figure 3 – Parker P4-12A0
Normally Open Bellows Valve
Cross Section Assembly

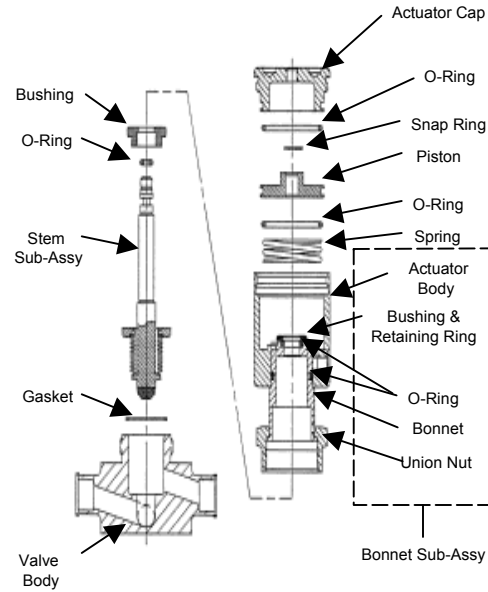


Figure 4 – Parker P4-12A0
Normally Open Bellows Valve
Exploded Assembly

WELDED PORT CONNECTIONS

Always consult your authorized Parker representative if questions arise.

Careful welding procedures are recommended and welding should be performed by trained, qualified personnel. Socket weld ports require the tube be inserted into the socket until bottomed against the stop. The tube is then to be backed out approximately 1/16 of an inch and then welded. This procedure will help in avoiding excessive static stress on the weld.

It is recommended all Valves with socket weld or butt-weld ports be disassembled prior to welding. The Upper Bonnet assembly is easily removed from the Valve Body. To prevent potential damage to the Valve Seat (if the Valve is not disassembled), place the Valve in the full open position and properly purge with gas.

1. Loosen the Union Nut with a 1 inch hex wrench and unthread it completely from the Valve Body. The Upper Bonnet Assembly is easily removed from the body.
2. Remove the gasket from the Valve Body.
3. Perform the welding operation and then allow the Valve Body to properly cool. The cooling process must proceed naturally in room temperature air to help prevent metallurgical defects in either the weld or the Valve Body. Always consult your authorized Parker representative if questions arise.

WARNING: Do not damage the gasket or seat sealing surface on the Valve Body.

4. Place the new Gasket in the Valve Body.
5. Reassemble the upper bonnet assembly to the Valve Body. Apply a small amount of lubricant, as consistent with the Valve's service requirements, to the Valve Body threads. Always contact your authorized Parker representative if questions arise.
6. Secure the Valve Body with a smooth-jawed wrench.
7. Torque the Union Nut to 50 Ft-lbs. (67 N-m) maximum.

SECTION 4: DOUBLE ACTING VALVE (P4-12AD)

For DOUBLE ACTING VALVES (P4-12AD) refer to Figures 5 and 6.

4A: GASKET REPLACEMENT

DISASSEMBLY

1. Remove the Bonnet Sub-assembly by unthreading the Union Nut from the Valve Body with a 1 inch hex socket wrench.
2. Remove the Gasket from the Valve Body.

REASSEMBLY

1. Place the new Gasket in the Valve Body.
2. Lightly lubricate the Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements.
3. Engage the Bonnet Assembly onto the Valve Body and torque the Union Nut to 50 Ft lbs. (67 N-m) maximum.

4B: STEM TIP and BELLOWS SUB-ASSEMBLY REPLACEMENT

DISASSEMBLY

1. Remove the Air Operator Cap from the Actuator Body using a 3/16 inch hex socket wrench.
2. Remove the Piston by first removing the Snap Ring from the Stem Sub-assembly.
3. Remove the Bonnet Sub-assembly by unthreading the Union Nut with a 1 inch hex socket wrench.
4. Remove the Gasket from the Valve Body.
5. Remove the Stem Sub-assembly from the Bonnet Sub-assembly.
6. Remove the Bushing from the Stem Sub-assembly.

REASSEMBLY

1. Insert the Bushing onto the new Stem Sub-assembly.
4. Insert the assembly of step 1 into the Bonnet Sub-assembly. Exercise caution to prevent damage to the O-Rings.
5. Install the piston onto the Stem Sub-assembly and secure the piston with the Snap Ring.
4. Install the Actuator Cap onto the Actuator Body.
5. Place the new Gasket into the Valve Body.
6. Lightly lubricate the Valve Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements.
7. Engage the Bonnet Sub-assembly onto the Valve Body and torque the Union Nut to 50 Ft-lbs. (67 N-m) maximum.

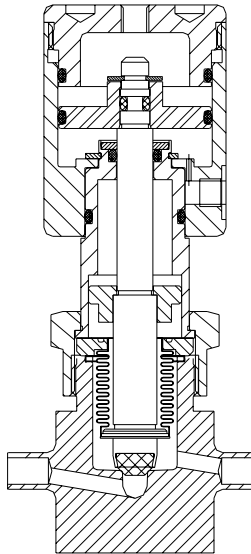


Figure 5 – Parker P4-12AD
Double Acting Bellows Valve
Cross Section Assembly

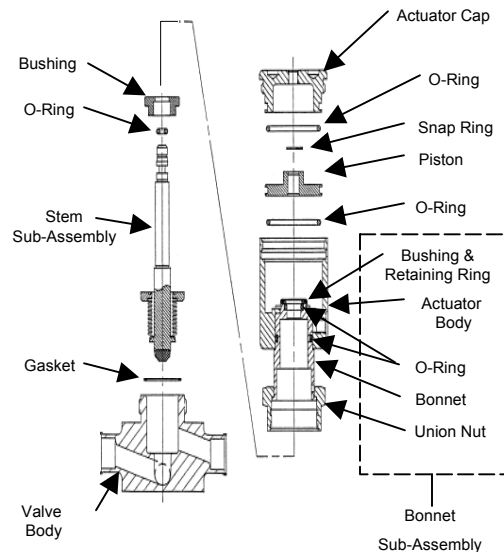


Figure 6 – Parker P4-12AD
Double Acting Bellows Valve
Exploded Assembly

VALVE CONNECTOR MAKE-UP INSTRUCTIONS

TUBE FITTING CONNECTIONS

1. Insert the tube into the Valve port until the tube bottoms out in the Valve Body. Care should be exercised to insure the tube is properly aligned with the Valve Body and port.
2. Normal make-up for port sizes 1 thru 3 (1/16 inch thru 3/16 inch) is 3/4 turn from finger tight. Normal make-up for port sizes 4 thru 16 (1/4 inch thru 1 inch) is 1 1/4 turns from finger tight.

PLEASE FOLLOW THE ABOVE DIRECTIONS FOR COUNTING THE NUMBER OF TURNS FOR PROPER FITTING MAKE-UP. DO NOT MAKE-UP TUBE FITTINGS BY TORQUE OR "FEEL". VARIABLES SUCH AS TUBING AND FITTING TOLERANCES, TUBE WALL THICKNESS, AND THE LUBRICITY OF NUT LUBRICANTS CAN RESULT IN AN IMPROPERLY ASSEMBLED TUBE FITTING CONNECTION.

ULTRASEAL CONNECTIONS

1. Insert the proper O-ring into the UltraSeal fitting's O-ring groove. Position the UltraSeal gland sealing face against the O-ring, and then advance the nut to a finger-tight position.
2. A positive seal is obtained by advancing the nut no less than 1/4 turn from the finger-tight position. Proper UltraSeal make-up is achieved when a sharp rise in required application torque occurs, which indicates proper seal face contact and O-ring seal compression into the UltraSeal groove.

VACUSEAL CONNECTIONS

1. A positive seal is obtained by advancing the nut 1/8 turn from the finger-tight position.
2. A new gasket should be installed upon each fitting re-make to insure system pressure integrity.