

# PPP-4P Precision High Pressure Pump

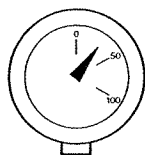


Operator's Manual

## OPERATING INSTRUCTIONS

**IMPORTANT:** Read all operating instructions and general operating information *before* beginning any test procedures.

### PRODUCING PRESSURE



- 1) Connect one of the Model PPP-4P's ports to the instrument to be calibrated or checked. Use small-diameter tubing as short in length as possible (this will maximize the pressure adjustment range). An auxiliary port is provided for simultaneous output to a second device, e.g., application of pressure to an instrument or system under test and to a pressure standard to measure the actual pressure output. If the auxiliary port is not used, it should be securely plugged.
- 2) Set the FINE ADJUST knob to the full counterclockwise position.
- 3) Turn the BLEED VALVE knob fully counterclockwise to relieve all system pressure and zero any measuring devices.
- 4) Turn the BLEED VALVE knob fully clockwise to close.
- 5) Repeatedly squeeze the handles to generate just under the desired pressure.
- 6) Use the FINE ADJUST knob to bring up the pressure to the precise level. The FINE ADJUST knob can adjust the pressure up from and down to the pressure generated by squeezing the levers.

- 7) Use the BLEED VALVE to lower the pressure from the pressure generated by squeezing the levers. Opening the BLEED VALVE 1/4 turn will lower the pressure very gradually. Opening it 1/2 turn will release the pressure faster and opening it 3/4 turn will quickly and safely release all the pressure in the system.

### WARNING



It is imperative that all system pressure is relieved prior to making any connections or disconnections. Failure to relieve system pressure could result in serious personal injury or equipment damage. Even nominal pressure values can generate extreme force if fitting or tubing failure occurs due to improper installation or usage. Since the Model PPP-4P is capable of generating pressures exceeding 100 psig, it is important that all pressure connections and test procedures be done by qualified service personnel, according to standard engineering practices, to prevent possible personal injury or equipment damage.

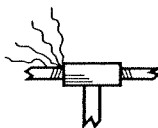
## GENERAL OPERATING INFORMATION

### CONNECTIONS

To install a pressure fitting in the Model PPP-4P:

- 1) Turn the BLEED VALVE counterclockwise to bleed any pressure
- 2) Remove the stainless steel port fitting from the pump body
- 3) Place the stainless steel port fitting in a vise and install a pressure fitting into the port fitting.
- 4) Hold the pump with the handles up and insert the stainless steel port fitting into the pump. Make sure that the O-ring and filter do not fall out.
- 5) Snug the fitting assembly using the wrench but do not overtighten. The O-ring compresses slightly to provide the seal. Overtightening may damage the O-ring or pump body.

### LEAK PREVENTION AND DETECTION



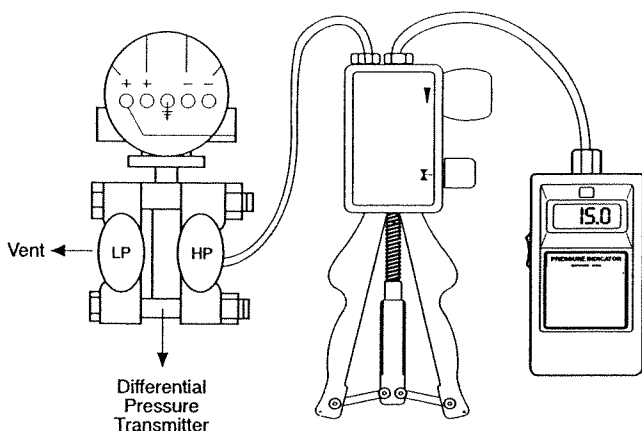
In order to obtain maximum pressure indication stability, leaks must be avoided. It is strongly recommended that either Teflon® tape or commercial pipe sealant be used at all tapered fittings and connections. If Teflon® tape is used, care must be taken that the proper amount is applied. Excessive tape may fray and cause plugging of relief valves, orifices, nozzles, etc. Overuse of pipe sealant may cause similar problems.

External equipment should also be checked carefully for leaks. Process connections, flange bolts, and vents must be tightly closed. Defective gaskets, leaking valves, and damaged diaphragms are all potential sources of leaks. For detection of very small system leaks, the traditional soap bubble method may not be sufficient. Halogen leak detection devices may be required when using highly sensitive pressure calibration equipment.

### TEMPERATURE CONSIDERATIONS

Since the pressure change of a contained volume of gas is directly proportional to absolute temperature, temperature control is critical when using the Model PPP-4P with any high-resolution measuring device. Tubing should be kept away from heat sources (i.e., lamps, operating electronic equipment, excessive hand contact, etc.) as well as from heat-dissipating structures (i.e., open windows, air conditioning vents, etc.) to minimize temperature variations that might induce errors.

Air is compressed when the Model PPP-4P's actuating levers are squeezed. This compression causes some heating of the air as it is forced into the system. Consequently, a noticeable decrease in pressure—caused by the cooling of the newly compressed air—may occur immediately after cessation of pumping.



# MAINTENANCE

## SERVICE NOTES

Please read before attempting any repair of this product

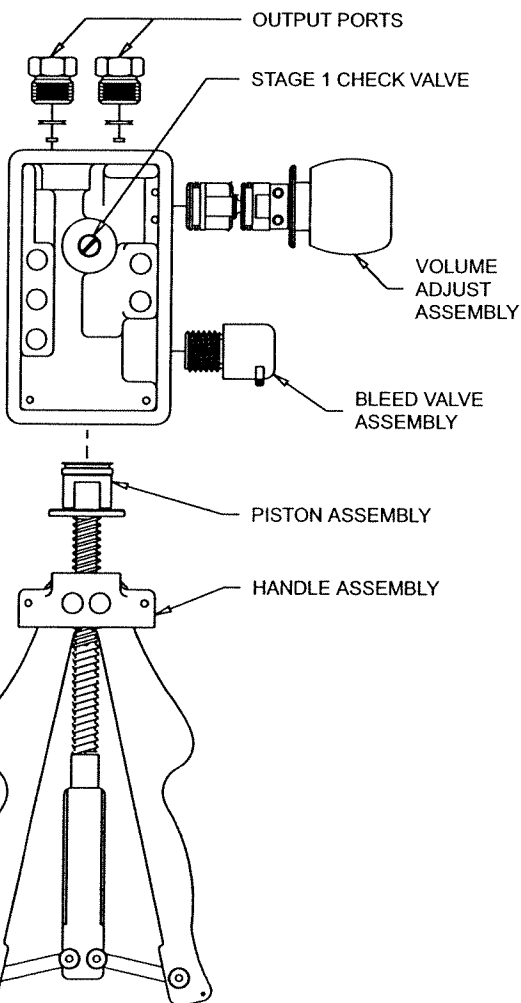
Field service procedures for the PPP-4P include replacing the O-rings, filters, and replacing damaged assemblies. It is strongly recommended that units requiring service beyond the scope of the procedures described below be returned to the nearest service location (refer to Section 5 for return and warranty information). Unauthorized repair or replacement of components may impair accuracy and/or void the warranty. No equipment will be accepted for service unless all process materials have been completely removed from all components by the customer. Contaminated pumps will be returned to the customer for proper cleaning.

**NOTE:** To prevent clogged internal passageways, exercise extreme care to avoid introducing contaminants into the pump body orifice. It is highly recommended that the following procedure be performed in a clean environment.



**WARNING!** It is imperative that all system pressure be relieved prior to making any connections or disconnections. Failure to relieve system pressure could result in serious personal injury or equipment damage.

Refer to this diagram for all procedures on this page



## Replacing the Piston Assembly

**Tools Required:** 3/32" Allen wrench; 3/4" wrench; Pliers

- 1) Turn the Bleed Valve fully counterclockwise to bleed all air.
- 2) Remove the two cover set screws and remove the cover.
- 3) Using the pliers, remove both handle assembly dowel pins.
- 4) Slowly actuate the handles until the handle assembly "pops" out of the pump body.
- 5) Place a pin or allen wrench into the hole in the steel shaft just below the handle assembly.
- 6) Using the wrench, unscrew the piston. Notice that wrench flats are supplied on the piston.
- 7) Install the replacement piston and snug with the wrench. Do not overtighten.
- 8) Install the handle assembly into the pump body.
- 9) Visually align the handle assembly/pump body dowel holes and install both dowel pins.
- 10) Install the front cover and set screws.
- 11) Check for proper pump operation.

## Replacing the Volume Adjust Assembly

**Tools Required:** 3/32" Allen wrench; Pliers

- 1) Turn the Bleed Valve fully counterclockwise to bleed all air.
- 2) Remove the two cover set screws and remove the cover.
- 3) Using the pliers, remove both volume adjust assembly dowel pins.
- 4) Withdraw the volume adjust assembly from the pump body.
- 5) Install the new volume adjust assembly.
- 6) Visually align the volume adjust assembly/pump body dowel holes and install both dowel pins.
- 7) Install the front cover and set screws.
- 8) Check for proper pump operation.

## Replacing the Bleed Valve Assembly

**Tools Required:** 1/16" Allen wrench; 5/8" wrench

- 1) Turn the Bleed Valve fully counterclockwise to bleed all air.
- 2) Using the Allen wrench, loosen the knob set screw.
- 3) Remove the knob.
- 4) Using the wrench, remove the bleed valve assembly from the pump body.
- 5) If necessary, install new filters in the bleed valve assembly (two filters are stacked on top of each other).
- 6) Orient the pump with the aperture down to prevent the filter or O-ring from being dislodged, then install the bleed valve assembly into the pump body. Snug the fitting using the wrench; do not overtighten.
- 7) Check for proper pump operation.

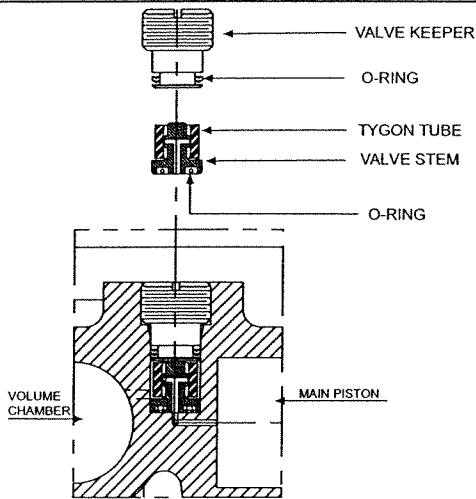
## Replacing a Pressure Fitting

**Tools Required:** 3/4" wrench

- 1) Turn the Bleed Valve fully counterclockwise to bleed all air.
- 2) Using the wrench, remove the output port fitting from the pump body.  
**NOTE:** It is highly recommended that the output port fitting be removed from the pump prior to pressure fitting removal or installation. The torque required to remove or install a pressure fitting in the output port fitting may exceed the pump body thread strength.
- 3) Secure the output port fitting in a vise or equivalent, remove the existing pressure fitting, then install a suitable replacement pressure fitting.
- 4) Invert the pump body (e.g. the handles up, the fitting aperture down) to prevent the O-ring or filter from being dislodged from the output port fitting, then install the output port/pressure port fitting assembly into the pump body. Snug the fitting assembly using the wrench; do not overtighten.
- 5) Check for proper pump operation.

## MAINTENANCE

Refer to this diagram for Stage 1 Check Valve



### Servicing the Stage 1 Check Valve

**Tools Required:** 3/32" Allen wrench, Large blade screwdriver

- 1) Turn the Bleed Valve fully counterclockwise to bleed all air.
- 2) Remove the two cover set screws and remove the cover.
- 3) Using the screwdriver, remove the valve keeper.
- 4) Invert the pump and remove the brass valve stem.
- 5) Remove the face seal O-ring, Tygon tube, and keeper O-ring from the valve stem.
- 6) Using a suitable lubricant, lube the replacement face seal O-ring and keeper O-ring.  
**NOTE:** When lubricating O-rings, use a silicone-based O-ring lubricant such as Parker Super Lube. Fully wet all O-ring surfaces, then wipe off all excess lubricant.
- 7) Install the replacement face seal O-ring, Tygon tube, and keeper O-ring on the valve stem as illustrated in Figure 4-2. Center the Tygon tube on the raised ridge of the valve stem.
- 8) Install the valve stem in the proper orientation in the pump body. Verify that the valve stem is seated properly.
- 9) Using the screwdriver, snug the valve keeper. Do not overtighten.
- 10) Install the front cover and set screws.
- 11) Check for proper pump operation.

## REPLACING FILTERS AND O-RINGS

Periodic inspection and replacement of selected O-rings and filters is recommended to ensure proper and safe pump operation. A service kit (P/N 36-009) is available that contains all serviceable filters and O-rings.

### Replacing a Filter

- 1) Remove the applicable assembly (i.e. Piston Assembly, Bleed Valve, or output port fitting) as instructed in the corresponding section.
- 2) Remove the old filter(s).
- 3) Verify that the filter seat is free from debris or contamination, then install the replacement filter(s).
- 4) Install the assembly as described in the corresponding section.

### Replacing an O-Ring

- 1) Remove the applicable assembly (i.e. Piston Assembly, Stage 1 Check Valve, Volume Adjust, Bleed Valve, or output port fitting) as instructed in the corresponding section.
- 2) Remove the old O-ring(s).
- 3) Using a suitable lubricant, lube the replacement O-ring(s).  
**NOTE:** When lubricating O-rings, use a silicone-based O-ring lubricant such as Parker Super Lube. Fully wet all O-ring surfaces, then wipe off all excess lubricant.
- 4) Install the replacement O-ring(s).
- 5) Install the assembly as described in the corresponding section.

## SPECIFICATIONS

### OUTPUT RANGE:

638-600: 600 psig, 41 kg/cm<sup>2</sup> or 4135 kPa  
638-300: 300 psig, 21 kg/cm<sup>2</sup> or 2070 kPa

**RESOLUTION:** 0.001 psig

### PRESSURE CONNECTIONS

Primary Port: 1/4"-18 NPT  
Auxiliary Port: 1/4"-18 NPT

**WEIGHT:** 0.9 kg (2 lbs.)

**MEDIA COMPATIBILITY:** Non-conductive, non-corrosive, instrument-grade clean air or inert gas

**CONSTRUCTION:** Polycarbonate alloy pump body; stainless steel output ports and piston rod



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**WARNING:** These products are not designed for use in, and should not be used for, patient connected applications

### RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to @OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. P.O. number to cover the cost of repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

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