

## PP901A & B Pressure Reducing Valves

### INSTALLATION INSTRUCTIONS

#### DESCRIPTION

The PP901A & B Pressure Reducing Valves regulate the pressure of air delivered to pneumatic control system devices. The PP901A operates in a single pressure system and delivers a regulated air pressure. The PP901B operates in a two-pressure system and delivers two independent regulated air pressures.

The PP901A & B include a safety relief valve that protects the downstream line from excessive main line pressure surges. A gage connection accommodates a 305915 0-30 psi Gage ("Gage") for measurement of the regulated pressure.

#### BEFORE INSTALLING NOTE

A coalescing filter is required upstream of the PP901A & B.

Also, if no Gage is used, PP901 installation requires a CCT1705T 1/8-inch Pipe Plug.

#### INSTALLATION

##### Mounting

Refer to job drawings and Fig. 1. Mount PP901A or B in one of the following ways:

- Wall- or panel-mounted using provided Bracket. Bracket includes mounting slots for two 1/4-20x5/8 inch screws (provided).
- Directly supported on system piping

##### Piping

- 1 Connect PP901A & B INLET and OUTLET piping (Fig. 1).
- 2 Mount Gage or CCT1705T Pipe Plug in 1/8-inch NPT gage connection on PP901A & B.



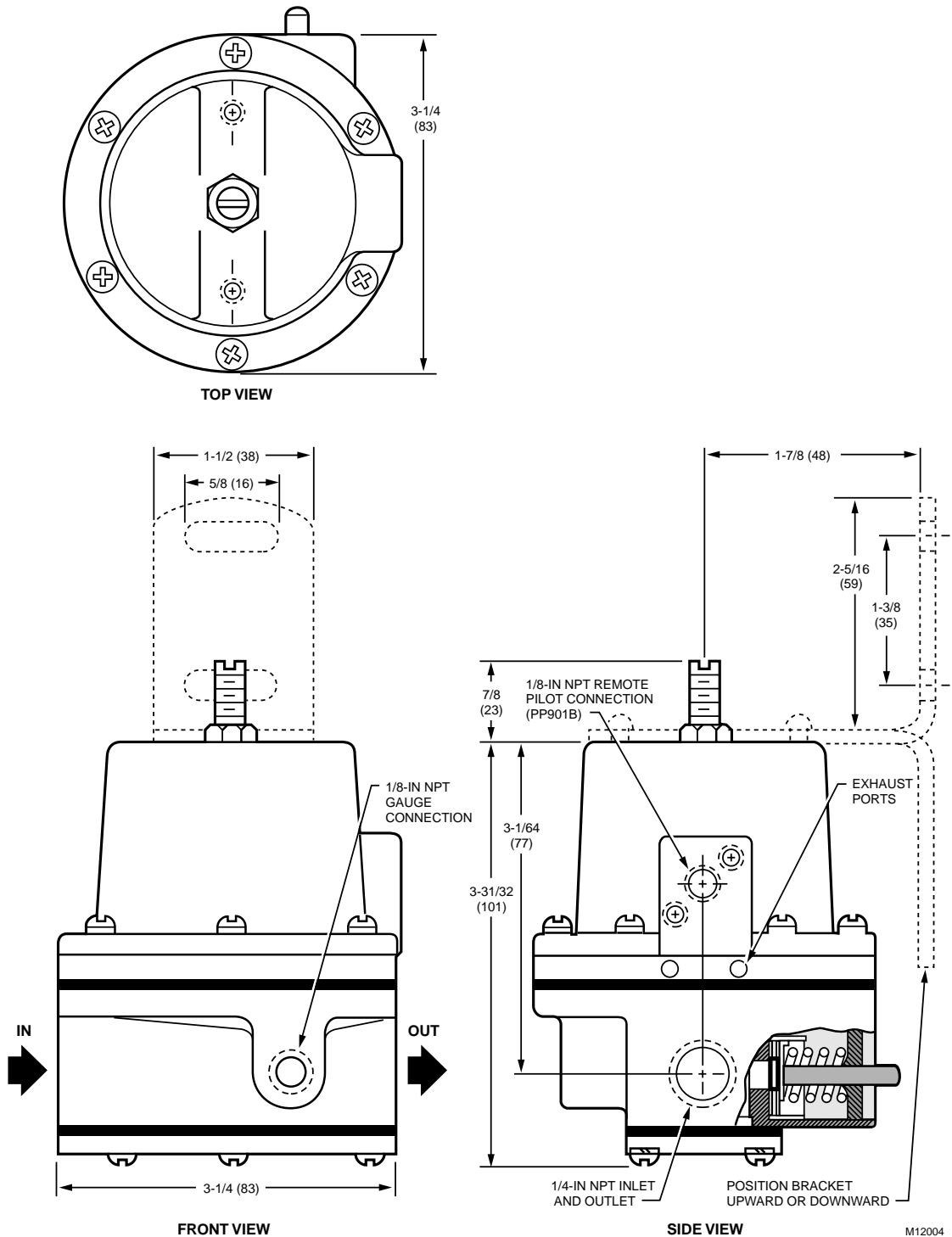


Fig. 1. PP901A & B Dimensions in Inches (Millimeters).

### Calibration

The PP901A & B is factory set for a regulated outlet pressure of 18 psi (124 kPa). The safety relief valve is factory set between 22 and 25 psi (152 and 172 kPa).

NOTE: The following procedures require that a Gage is mounted in the 1/8-inch NPT gage connection on the PP901A & B.

### Primary Reduced Pressure Setting

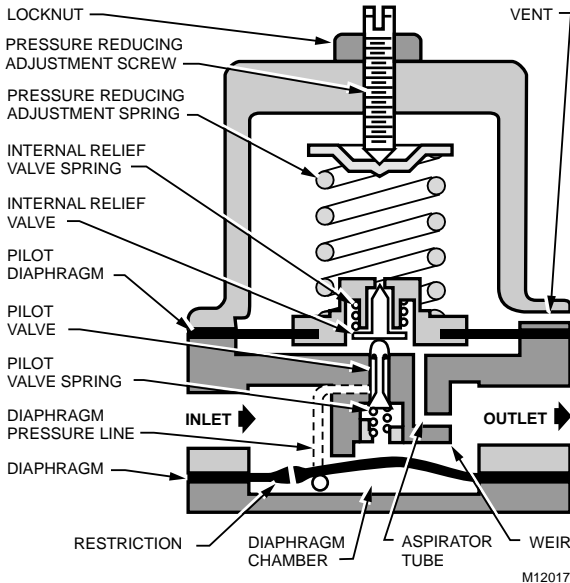
Use the following procedure to change the regulated (primary) outlet pressure to the desired system pressure.

#### PP901A (Fig. 2)

- 1 Loosen locknut and turn pressure reducing adjustment screw clockwise to increase regulated outlet pressure.
- 2 Tighten locknut to maintain position of pressure reducing adjustment screw.

**PP901B (Fig. 4)**

Turn pressure reducing adjustment screw clockwise to increase primary (lower) pressure. (For primary pressure, the pressure reducing adjustment screw on the PP901B does not have a locknut.)

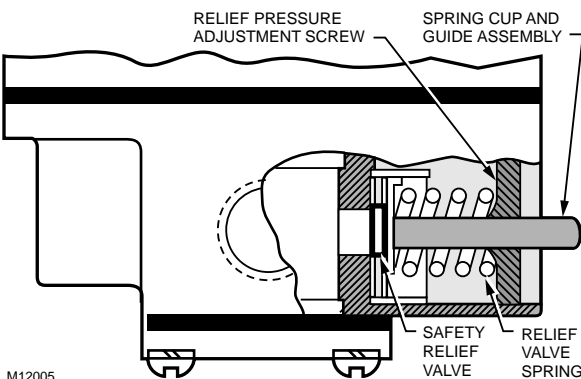


**Fig. 2. PP901A Schematic.**

**Safety Relief Pressure Setting**

Use the following procedure and refer to Fig. 3 and 4 to change the safety relief valve pressure:

- 1 Using a spanner wrench or similar tool, turn safety relief pressure adjustment screw inward as far as it turns.
- 2 Adjust primary reduced pressure setting (per Primary Reduced Pressure Setting procedure) until it exceeds the desired safety relief pressure setting.
- 3 Slowly back off safety relief pressure adjustment screw until Gage reads the desired safety relief pressure setting.
- 4 Reset the pressure reducing adjustment screw for the desired reduced pressure (per Primary Reduced Pressure section).



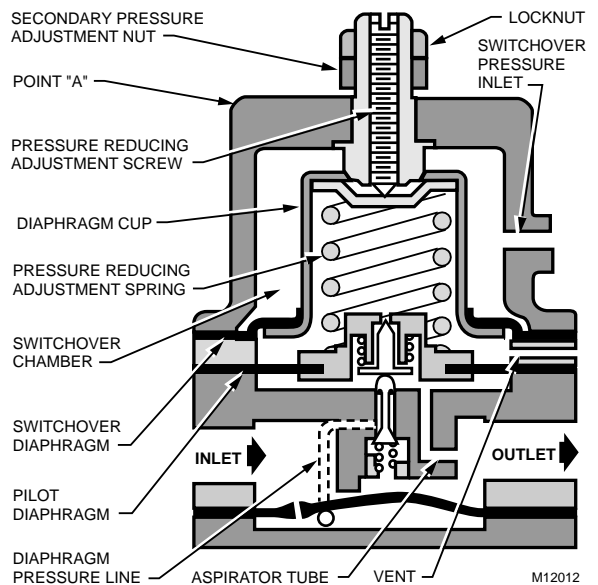
**Fig. 3. PP901A & B Safety Relief Valve.**

**Secondary Reduced Pressure Setting (PP901B Only)**

Use the following procedure and Fig. 4 to change the secondary (higher) pressure to the desired system pressure.

**NOTE:** Perform the Primary Reduced Pressure Setting procedure before this procedure.

- 1 Position switching mechanism to allow air passage into switchover chamber.
- 2 Loosen locknut on pressure reducing adjustment screw.
- 3 Rotate secondary pressure adjustment nut a few turns in either direction until Gage reads desired secondary pressure.
- 4 Tighten locknut to maintain position of pressure reducing adjustment screw.



**Fig. 4. PP901B Schematic with Switchover Chamber.**

**ENGINEERING DATA**

**Specifications**

**Models:**

- PP901A: For single pressure systems
- PP901B: For two-pressure systems

**Pressure Range:**

- Inlet: 45 to 150 psi (310 to 1034 kPa)
- Outlet: 0 to 25 psi (0 to 172 kPa); factory set at 18 psi (124 kPa)

**Maximum Airflow:**

- 10 scfm (0.05 m/s) at 18 psi (124 kPa)

**Safety Pressure Relief:**

- Adjustment Range: 12 to 25 psi (83 to 172 kPa)
- Factory Setting: 22 to 25 psi (152 to 172 kPa)
- Capacity at 20 psi (138 kPa) outlet: 5 scfm (0.03 m/s)

**Switchover (PP901B):**

- Two-position pilot switch actuated electrically or pneumatically. Pressure relief feature exhausts pressure difference.
- Adjustment Range: 0 to 5 psi (0 to 35 kPa)
- Factory Setting: 4.5 psi (31 kPa) ± .5 psi (3.5 kPa) over low setting

**Connections:**

- Inlet and outlet: 1/4 in. NPT (female)
- Gage: 1/8 in. NPT (female).
- Remote Pilot (PP901B): 1/8 in. NPT (female)

**Accessories:**

- 14004205-002 Coalescing Filter
- For PP901B switchover:
  - RP418A/B Electric-Pneumatic Relay or SP470A/B Two-Position Pneumatic Switch
  - 14003638-001 Mounting Kit

**Operation**

**PP901A & B (Fig. 2)**

A given pressure reducing adjustment screw setting creates a force on the pilot diaphragm by tension on pressure reducing adjustment spring. This force moves the internal relief valve against the pilot valve and causes the pilot valve to move downward and off its seat.

As high pressure air enters the valve through the INLET, it passes between the weir and the diaphragm and onward to the valve OUTLET. At the same time, air travels through the open pilot valve, diaphragm pressure line, and diaphragm chamber until its pressure equals that of the inlet pressure.

As downstream pressure increases, air pressure builds beneath the pilot diaphragm through the aspirator tube connection with the downstream line.

Downstream pressure and air pressure beneath the pilot diaphragm continue to rise. The force acting on the pilot diaphragm overcomes the force of the pressure reducing adjustment spring. This action forces the pilot diaphragm and internal relief valve upwards and allows the pilot valve to return to its seat.

With the pilot valve on its seat, air in the diaphragm pressure line cannot escape and is trapped in the line. Air continues to enter the diaphragm chamber through the small restriction in the diaphragm and pressure builds up in the diaphragm chamber. This pressure forces the diaphragm against the weir and cuts off air flow through the valve.

A small reduction in the downstream pressure now causes the pilot diaphragm to force the pilot valve off its seat. This allows main line pressure to leak from the diaphragm chamber through the diaphragm pressure line and pilot valve to the downstream side of the system. When this side of the system reaches its preset pressure, the pilot diaphragm moves upwards and closes the pilot valve.

If the pilot diaphragm continues to move upward from over-pressure in the downstream line, it allows the internal relief valve spring to force the internal relief valve off its seat and bleeds the downstream pressure to the atmosphere through the vent.

**Setting the Safety Relief Pressure (Fig. 3).**

If excessive downstream pressure builds up inside the valve it acts against the safety relief valve. If pressure becomes high enough the force of the air pressure on the safety relief valve overcomes the force of the safety relief valve spring and opens the safety relief valve. With the safety relief valve open any excessive pressure is bled from the valve to the atmosphere.

**PP901B Switchover Operation (Fig. 4)**

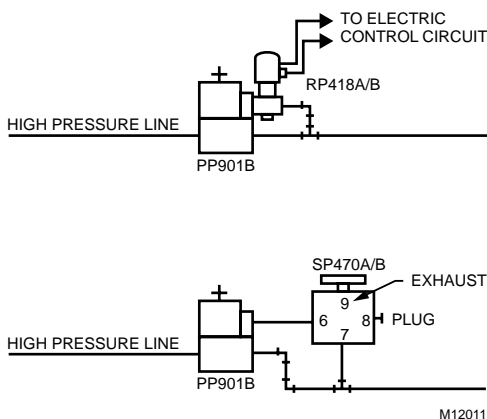
Air from the switching mechanism enters the airtight switchover chamber through the switchover pressure inlet. This air pressure acts on the diaphragm cup and switchover diaphragm to overcome the force of the pressure reducing adjustment spring. As the switchover diaphragm and switchover cup move downward, they further compress the pressure reducing adjustment spring.

At the same time the flow of air creates a low pressure in the aspirator tube and in the chamber beneath the pilot diaphragm. This low pressure aids in moving the diaphragm cup down and speeds up the switchover operation. The downward movement of diaphragm cup is stopped when the secondary pressure adjustment nut comes in contact with the valve body at point "A".

The combination of the forces of the two pressures (the pressure reducing adjustment spring and the controlled pressure on the switchover diaphragm) require greater pressure (from the downstream line acting below the pilot diaphragm) to close the pilot valve. These pressures maintain a higher pressure in the downstream line during this phase of operation.

**Application(s)**

The PP901B includes a 1/8-inch NPT remote pilot connection to handle the switchover from one pressure to another. The remote pilot can be a two-position switch that is actuated electrically or pneumatically. For example, a RP418A/B Electric-Pneumatic Relay or SP470A/B Two-Position Pneumatic Switch can connect to this mounting boss to introduce the air pressure that switches the PP901B from one pressure to another (Fig. 5).



**Fig. 5. PP901B Switchover Piping.**

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