Armstrong ADP-1 Pneumatically Operated Liquid Drainer for Air Service

Installation, Operation and Maintenance

This bulletin should be used by experienced personnel as a guide to the installation and maintenance of the ADP-1 Liquid Drainer. Selection or installation of equipment should always be accompanied by competent technical assistance. We encourage you to contact Armstrong or its local representative if further information is required.

Installation

Caution: Compressed air can be dangerous. Do not attempt to install the ADP-1 Liquid Drainer unless the pressure vessel on which the drainer will be installed is completely depressurized.

The drainer should **not** be installed in areas that are exposed to freezing temperatures (optional heater is available).

Be certain the air system pressure does not exceed the 180 psi (12 bar) operating pressure. The air supply pressure to the control system should not exceed 120 psi (8.3 bar). The inlet liquid or air temperatures should not exceed 150°F (66°C). Connecting the drainer to the air system should be done by using one of the recommended installation diagrams shown on Page 3. The installation of a strainer is not required or recommended.

Install the drainer as close to the source to be drained as possible. Since the ADP-1 uses gravity to fill the reservoir, the drainer must be installed below the vessel to be drained. If flexible tubing is used on the liquid discharge, be certain it is properly fastened to prevent it from whipping when the drainer discharges liquid. Always be careful not to turn the discharge ball valve when piping the outlet line, as this can cause the linkage to bind. The ADP-1 will accept liquid at either the top or the bottom inlet connections of the reservoir. If the bottom inlet is utilized, then a balancing (vent) line must be used to ensure that the air in the reservoir can be displaced as liquid fills the reservoir. Install the balancing (vent) line (1/4" tube) in the outlet of the needle valve on the side of the drainer. The other end of the balancing (vent) line should be run back to the air system to a point just downstream from the source that is being drained. An alternative to the use of a balancing (vent) line is to open the needle valve and allow the drainer to vent to atmosphere. Use nongalling pipe sealant on all joints. The use of isolation valves and unions is recommended on both the inlet line and balancing (vent) line. The inlet port that is not used must be plugged by using a standard NPT pipe plug. It is best to run the drain line in a downward pitch from the bottom of the vessel being drained to the inlet of the ADP-1.

The power to operate the ADP-1 comes from compressed air. **Only clean dry air should be used**. The control air supply pressure should be between 80 and 120 psig (5.5 - 8.5 bar). The use of unfiltered air can cause the ADP-1 liquid drainer to fail.

Checking the ADP-1 Drainer's Operation

After installation is complete and the drainer is on line, a check should be made to see whether liquid is properly entering the reservoir. This can easily be done by looking through the translucent reservoir.

If liquid is not entering the reservoir, check for the following:

1. Make sure the isolation valve is open on the liquid inlet line.

2. Do not use the bottom inlet on the ADP-1 without installing a balancing (vent) line or venting to atmosphere.

3. If a balancing (vent) line is installed, make sure it is down stream from the vessel that is being drained.

4. Be certain that the ADP-1 reservoir is not higher than the vessel that is being drained. This is very important when using the top inlet on the ADP-1 reservoir.

5. Check to make sure the vessel being drained has liquid in it.

If the top inlet is being used and no liquid is entering the ADP-1's reservoir, and all the above items have been checked, we recommend that the bottom inlet be used with a balancing (vent) line. If liquid fills the reservoir and the drainer does not operate, check to see if control air is being supplied to the control air inlet. The ADP-1 is supplied with a press-to-test actuator so the supply of control line air can be checked by pushing the test actuator. If the ADP-1 does not operate, then no air is being supplied or the air inlet is plugged.

In General

In order for the liquid to properly enter the ADP-1's reservoir, the liquid line to the ADP-1 must always be installed below the bottom of the vessel to be drained. It is equally important to provide a means for the air that is contained in the reservoir to escape (vent) as the liquid enters the reservoir. If the air cannot escape, the liquid will not enter the reservoir. Below are suggestions on how to best install the ADP-1 on typical types of vessels that have to be drained of liquid. The use of unions and shut-off valves are recommended for both the liquid line and the balancing (vent) line.

Receiver Tank

The preferred installation for a ADP-1 on a receiver tank is having the liquid enter the top inlet port and having the balancing (vent) line go back to the tank at a position that is above the level of the liquid (Figure 3-1 on Page 3). If the bottom inlet connection is used, either a balacing (vent) line or atmospheric venting **must** be provided.

Filter and Aftercooler Moisture Separator

If a cyclone separator or filter has pipe plugs located in the top of the head, the plug closest to the discharge pipe should be removed and the balancing (vent) line should be installed (Figure 3-2, Page 3). If there is no provision on the cyclone separator or filter for a balancing (vent) line, install it in the discharge side of the pipe line and as close to the cyclone separator as possible.

Refrigerated Dryer

If a balancing (vent) line is required, it must be connected to the port located on top of the separator that is closest to the discharge side (Figure 3-2 on Page 3), or between the separator and the air-to-air heat exchanger. If a port is not available as described above, then venting to atmosphere is recommended. When venting to atmosphere, the liquid should enter through the bottom entry port on the drainer. The vent valve is installed in a 1/8" NPT vent port and allows the air in the ADP-1 reservoir to escape to the atmosphere (Figure 3-3 on Page 3). The vent valve should be adjusted so that only 3 to 5 bubbles per second are visible. We do not recommend installing a balancing (vent) line down stream from the dryer. The vent line can be a conduit for transferring moisture from the drain to the previously dried air. This can result in unwanted moisture being sent down stream.

Intercoolers

Install the liquid drain line into the upper port only. This will prevent the possibility of liquid being drawn back into the intercooler on some systems. It is important that the balancing (vent) line be installed on the same stage that is being drained or to atmosphere.

Balancing (Vent) Line

As mentioned above, both the use and the placement of a balancing (vent) line is very important. Most drainer failures are the result of an improper balancing (vent) line installation. The balancing (vent) line should be 1/4" tubing or larger, and installed on top of a pipe or vessel, not the bottom. A vent valve is supplied for controlling the air flow. Avoid having any loops or low areas in the balancing (vent) line that might allow moisture to collect in the line and prevent the passage of air from the drainer's reservoir.

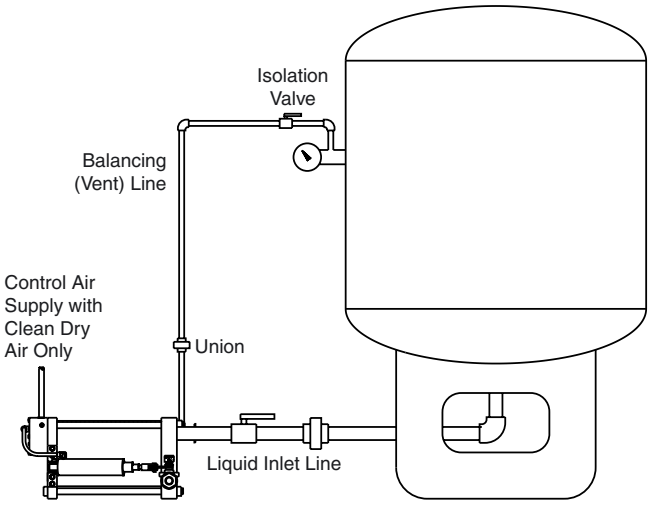

Figure 3-1

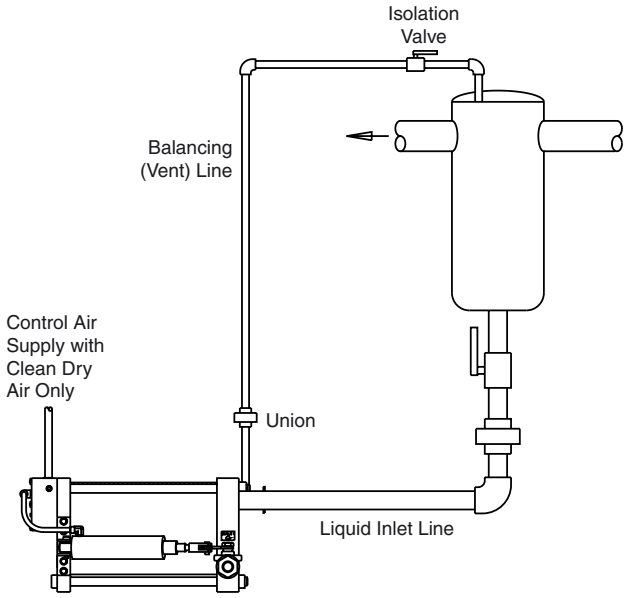

Figure 3-2

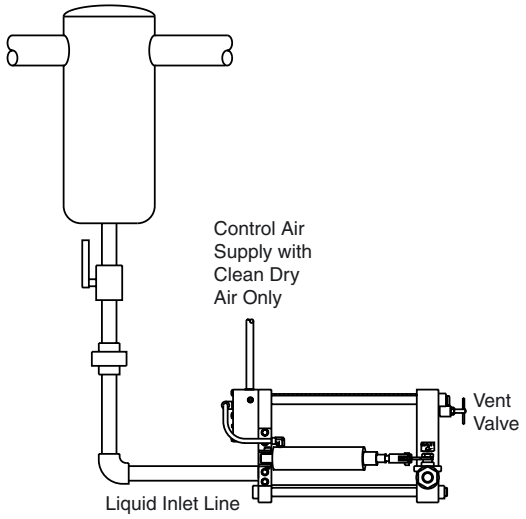

Figure 3-3

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Installation Bulletin No. IB-68 9/03
Printed in U.S.A.