Pressurized Expansion Tanks (ASME)

INSTALLER: PLEASE LEAVE THIS MANUAL FOR THE OWNER’S USE.

SAFETY INSTRUCTIONS
This safety alert symbol will be used in this manual to draw attention to safety related instructions. When used, the safety alert symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.

WARNING: Explosion Hazard
Failure to follow instructions in the accompanying product manual can cause rupture or explosion, possibly causing serious or fatal injury, leaking or flooding and/or property damage.

NOT FOR USE IN DOMESTIC (POTABLE) WATER SYSTEMS
DANGER: Series “B”, “D”, & “B-LA” are for use in closed loop systems only. Domestic, potable or fresh water can cause serious corrosion in a tank. This can result in leakage and a potential explosion. Do not use for domestic, potable or fresh water. Failure to follow this instruction will result in serious personal injury or death and property damage.

OPERATIONAL LIMITS
Maximum Operating Pressure: 125 psi (or as stamped on nameplate)
Maximum Operating Temperature: 240°F
Minimum Operating Temperature: 35°F (non-glycol application)
18°F (glycol application)

WARNING: Carefully read the Instruction Manual to avoid serious personal injury and property hazards and to ensure safe use and proper care of this product.

DESCRIPTION
Precharged Expansion Tanks contain either a bladder or a diaphragm to separate the air charge from the system water. Tanks are designed to absorb the expansion forces of heating/cooling system water while maintaining proper system pressurization under varying operating conditions.
**INSTALLATION**

1. Note location of system connection, air charge valve and drain connection on tank.
2. Remove the plug or pipe cap from the system connection.
3. Remove the 1'/4" NPT plug covering the air charge valve.
4. Before making any connection to the tank, check the tank and air charge (use an accurate pressure gauge). The air pressure must be equal to the minimum system pressure at the tank location.
5. After making sure the air charge is correct, replace the 1'/4" plug over the air valve.
6. The tank may now be piped to the system (use the suggested tank piping diagram on page 4 and 5).
7. Using table A, select appropriate pipe size. Connection to each tank must have a lock shield gate valve or TPV and union to allow isolation and removal if required. Make up and fill valves, whether manual or automatic, should be tied into the connecting line. This will ensure that pump operation will not affect valve operation.
OPERATING INSTRUCTIONS

1. Check the expansion tank pre-charge before the system is filled with water. The charge is 12 psig unless noted otherwise on the tank label. Check to make sure this is the correct precharge pressure specified for the system. Precharge should match system fill pressure at point of tank installation. If increasing precharge, the tank must be connected immediately to the system. The tank should not be isolated at this condition. Failure to do so could result in damage to the bladder and void all warranties.

2. If the tank pre-charge pressure needs to be changed on a dry system follow the following procedure:
   a. Check the expansion tank air pressures at the precharge connection with an accurate tire type pressure gauge. The pre-charge connection is the same kind of connection found on automobile tires.
   b. If the pressure is low, charge the tank with nitrogen gas or with oil-free compressed air. Check the pressure frequently during this process as you would when filling a tire with air.

   **DANGER:** Excessive pressure can cause tank to explode. Exercise care when filling a tank with air so the pressure does not exceed that required or does not exceed the working pressure of the tank as stamped on the nameplate. Failure to follow these instructions will result in serious personal injury or death and property damage.

   **IMPORTANT:** Expansion tank cannot be properly air charged other than at ambient temperature.

   b. Close the lock-shield valve in the tank-to-system piping.
   c. Open the drain valve or TPV to empty the water from the tank.
   d. Check the tank air pressure at the pre-charge connection with an accurate tire type air gauge.
   e. Refer to 2b above.
   f. Close the drain valve, open the lock-shield valve and turn on the heat source.
   g. Relock the lock-shield valve.

SERVICE INSTRUCTIONS

1. Check the expansion tank periodically for signs of external leakage or corrosion. If found, the tank must be replaced.

   **DANGER:** Signs of leakage or corrosion are indications the tank may explode. Periodically check the expansion tank for signs of external leakage or corrosion. If found, the tank must be replaced. Failure to follow these instructions will result in serious personal injury or death and property damage.

2. If the tank fails to hold the pre-charge pressure it could be the result of one of the following.
   a. Leakage of air valve. Do not depend on the valve cap to seal leak.
      1. Refer to items 3a thru 3d under operating instructions to prepare the tank so that the air charge core can be changed.

   **WARNING:** Improper use of air charging valve during venting of air pressure from tank will create a hazardous condition due to the escape of high velocity gas and/or liquid. Depress the center valve core stem, as with a tire valve, to slowly vent off gas pressure. Do not remove the valve core until pressure in the expansion tank has reached zero. Failure to follow these instructions could result in serious personal injury or death and property damage.

3. If, after the system has been filled with water and operating, it is found that the expansion tank pre-charge must be changed use the following procedure:
   a. Turn off the heat source and allow the system water to cool to ambient temperature.
   b. The bladder or diaphragm is leaking as indicated by liquid on the gas side or the inability of the tank to maintain its gas cushion. If the tank is a diaphragm type, the tank must be replaced. Diaphragm tanks can be identified by the model numbers beginning with a “D” and the absence of a large flanged opening to remove the bladder. If the tank is a bladder type, the bladder can be replaced as follows:
      1. Refer to items 3a thru 3c under operating instructions to prepare the system for replacement of the bladder.

   **WARNING:** Residual system pressure is a serious hazard when attempting to replace tank bladder. Make sure that all fluid has stopped draining from the drain valve and the system pressure is zero. If leaking continues from the drain valve, the lock-shield isolation valve must be replaced before proceeding. Failure to follow these instructions could result in serious personal injury or death and property damage.

   2. Depress the center valve core stem on the air side of the tank, as with a tire valve, to slowly vent off the air or gas charge.

   **WARNING:** Removing the bladder housing cover with an air charge or pressure still in the tank can cause the cover to be blown off. Make sure that all gas charge pressure and system pressure is removed from the tank before loosening or removing cover bolts. Failure to follow these instructions could result in serious personal injury or death and property damage.

   3. Remove the bolts from the flanged cover to gain access to the bladder. Series B-LA tanks must be disconnected from the system. Remove the bottom drain plug to drain fluid.
   4. Pull the bladder from the tank through the flanged opening.
   5. Make sure all flange surfaces are clean and free of corrosion so that the new bladder will seal properly. If corroded, the tank must be replaced.
   6. Install the new bladder in the tank by stuffing through the flange opening in the reverse manner that the old bladder was removed. The Partial Acceptance tank has a support pipe, which the bladder will fit around. Insert the new bladder into bottom of the tank. To make system connection, align elbow with hole in skirt.
   7. Replace the flanged cover and tighten the bolts in a crisscross pattern. Take care not to exceed the allowable torque of the bolts. Screw in drain plug.
   8. Refer to item 3e thru 3g under operating instructions to place the system back in operation.
   9. Check for gas leaks around the flange connection. If leaks are found, lightly tighten bolts in a criss-cross pattern, again being careful not to exceed the allowable torque of the bolts. If leaking continues, the expansion tank will have to be replaced.
FIGURE NOTES

1. Tank connection locations may vary depending on the type of tank to be installed.
2. Provide an anti-thermosyphon loop with a minimum drop of 12" to prevent gravity heating of the tank.
3. Figures 1 and 2 show where a tee would be located if multiple expansion tanks are installed.

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**Figure 1**
Vertical Tank Installation with Rolairtrol Air Separator

**Figure 2**
Horizontal Tank Installation with Rolairtrol Air Separator

**Figure 3**
Typical Piping with IAF In-Line Air Separator and Airtrol Boiler Fitting

**Figure 4**
Tank Installation with IAS In-Line Air Separator
### TABLE A - MINIMUM PIPE SIZE FROM TANK TO SYSTEM (IN INCHES)

| MBH  | 100 | 150 | 200 | 250 | 300 | 100 | 150 | 200 | 250 | 300 | 100 | 150 | 200 | 250 | 300 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 2,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 3,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 4,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 5,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 6,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 7,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 8,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 9,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 10,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 12,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 14,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 16,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 18,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
| 20,000| 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 |
1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We’re 12,500 people unified in a common purpose: creating innovative solutions to meet our world’s water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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