

P-Series: IOM

Positive Plenum Pressure Waterless Trap

Patented

This is a guide to the user of an P-Series *Air-Trap* during installation, commissioning, operation, or periodic maintenance.



Product Description

The P-Series *Air-Trap* allows water to drain from HVAC equipment and simultaneously prevents air from escaping from the equipment.

The P-Series *Air-Trap* does not require standing water to prevent gas (typically air) from leaving the HVAC unit. With the occurrence of condensate, or other water sources within the unit, the water flows out of the HVAC unit but no gas escapes. When there is no production of condensate or water, there is no water in the trap and there is no gas leaving through the trap. **Install the P-Series Air-Trap in a vertical position.**



DO NOT USE EXCESS CEMENT.

Too much cement could interfere with ball movement and cause trap failure.

NEVER CONNECT CONDENSATE DRAIN DIRECTLY TO A SANITARY DRAIN LINE.

DO NOT PUNCTURE FLOAT VALVE.



Failure to provide adequate drainage piping may result in water damage to equipment or building.

Important: Make sure a strainer screen, as shown in **Figure 1**, is placed over the drain inlet prior to operation of the HVAC unit and before installing the trap. An integral *Union-Strainer™* may also be inserted in the drain line upstream of the *Air-Trap* as shown in **Figure 8**.

Figure 1 - Strainer screen

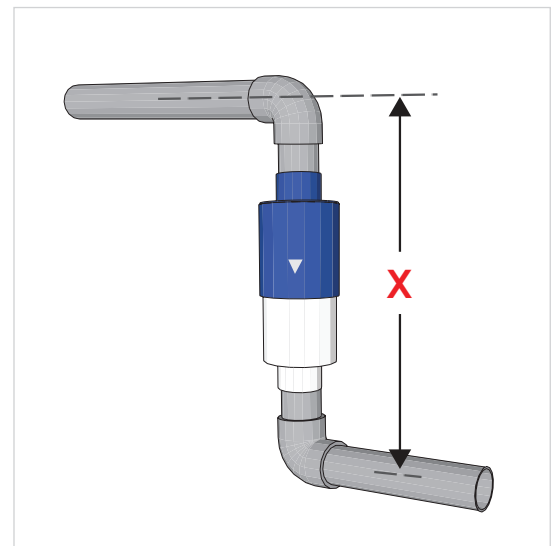


Installation

For positive pressure cooling section(s), always connect the drain pan directly to a trap to ensure proper drainage of condensate while simultaneously preventing escape of air from the unit.

1. Install the P-Series *Air-Trap* vertically with the end marked "top" facing upward and the embossed arrowhead, ▼, pointing downward (**Figure 2**). This is a requirement for proper movement of the internal float valve component.
2. Install the trap in accordance with manufacturer's instructions and with all applicable local or national plumbing, drainage, and mechanical codes.
3. NEVER CONNECT CONDENSATE DRAIN DIRECTLY TO A SANITARY DRAIN LINE. Connect only to a storm drain or a condensate drain line.

Figure 2 - P-Series Air-Trap Installation



Operation

The P-Series *Air-Trap* operates dry when no water removal is required and wet when it is required. When dry, essentially no air exits the HVAC unit. When removing water, the water exits the unit, but essentially no air exits the unit through the drain connection.

Install the P-Series *Air-Trap* in a vertical orientation. With no production of condensate within the AHU the positive pressure that exists within the plenum that contains the drain line forces the capsule (or spherocylinder), downward onto the valve seat. With the production of water within the plenum, the capsule rises from the seat when the net buoyancy force upward equals or exceeds the net downward force created by air pressure. See cutaway view in **Figure 3**.

The standard model P-Series operates as a positive trap up to 12 inches WG of positive pressure. If a pressure of more than 12 inches WG could occur, then please contact Des Champs Technologies for information on the Engineered P-Series *Air-Trap*.

The P-Series *Air-Trap* accomplishes the following:

- Reduces sludge buildup that normally accumulates in standard "P" traps
- Prevents freezing of trap during cold periods since during periods of no water removal there is no water in the trap. If, for some reason, water is flowing from the unit during freezing temperatures, and the trap is located within this freezing temperature region, then the trap will require thermal protection.
- P-Series *Air-Trap* requires no water head to cause the trap to operate. Simply come out of the plenum with the condensate line and go down into the P-Series *Air-Trap*. Come out of the trap and go horizontally with your drain line. The height, **X**, requirement then becomes the height of the trap plus two street elbows. See **Figure 2**.
- Eliminates air escaping from an HVAC unit that would result from a standard P-trap experiencing a "dry-out" condition.
- Note: If there is a possibility of a syphoning effect (suction pressure) at the exit point of the *Air-Trap* then it is necessary to install a vent as close as possible to the bottom of the trap (see **Figure 9**).
- If height, **X**, is an issue, the P-Series *Air-Trap* may be installed at a 45° angle, as shown in **Figure 5**. When installed at a 45° angle, the maximum positive pressure it can withstand is 5" of WG instead of 12". The reduced pressure capability is a result of a reduction in buoyancy.
- Another option when height is an issue is to install the N-Series *Air-Trap* vertically, as opposed to horizontally when used as a negative trap, shown in **Figure 6**. The maximum positive plenum pressure it can withstand is 3" of WG. The cleanout port is on the bottom when used for positive pressure.

Figure 3 - 1/2 inch cleanout port - Standard Model of P-Series *Air-Trap* up to 12" of positive pressure.

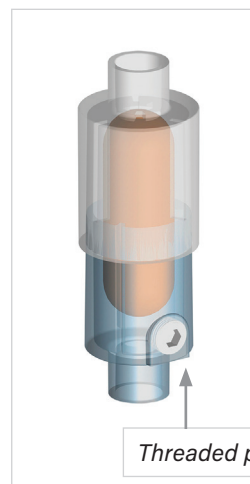


Figure 4 - 3/4 inch thread cleanout plug - Engineered Model of P-Series *Air-Trap*, for positive pressure above 12" up to 50" WG.

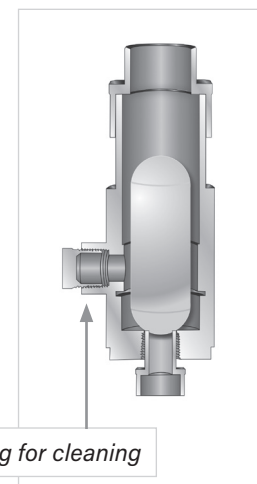


Figure 5 - P-Series *Air-Trap* installed at 45° angle can reduce trap height by 30% and operate at up to 5" of positive pressure.



Figure 6 - N-Series *Air-Trap* when installed vertically can operate properly up to 3" of positive pressure.



Maintenance and Techniques for Cleaning the P-Series Air-Trap

In some operations, particulate matter can move from the HVAC unit through the drain line and into the P-Series Air-Trap. The accumulation of particulate matter in the trap may cause the trap to operate less efficiently or fail. Therefore, a means to remove the accumulated debris is required. A stainless steel filter screen (**Figure 1**) over the drain inlet or a *Union-Strainer™* (**Figures 7 & 8**) within the drain line extends the time between maintenance. Install the Union-Strainer upstream of the Air-Trap.

There are several other options for cleaning. Option 1, is to use the 1/2 inch cleanout port in the trap housing. This will allow insertion of a water or air hose for washing or blowing away material that may be hampering operation of the trap. See **Figure 3**.

Option 2, shown in **Figure 7**, is to isolate the P-Series Air-Trap from the main drain line by installing unions that allow Air-Trap removal for replacement or cleaning.

The best way to reduce maintenance is to install a Des Champs Union-Strainer upstream of the Air-Trap, (See **Figure 8**). The Union-Strainer is also a convenient way to prevent unwanted creatures and objects from entering the terminus of the drain line, like snakes, rats, lizards, insects, and other miscellaneous items like, rocks, screws, and nuts. The water flow is in direction of arrow shown in **Figure 8**, with the strainer cup oriented to capture debris within the cup.

Des Champs Technologies also offers engineered traps for positive plenum pressure above 12 inches in WG. **Figure 4** is a cut away view of an engineered trap showing a cleanout port and the cylindrical float that rises off the seat when condensate begins to accumulate in the trap. Engineered Air-Traps are designed for applications above the 12 inches of positive pressure of the standard P-Series Air-Trap. The Engineered Air-Trap can withstand positive pressure up to 50" of WG or greater. **Caution, do not puncture the Float Valve.**

Inspect the P-Series Air-Trap on an annual basis; remove any sludge or foreign materials that might obstruct proper operation of the internal mechanism or general drainage of the drain line. Remove obstacles utilizing the clean out port located at the bottom of the Air-Trap. Caution – do not damage the internal mechanism inside the P-Series Air-Trap. Properly dispose of any contaminated materials.

Limited Warranty

Des Champs Technologies warrants to the original consumer purchaser ("Purchaser") of its product, P-Series Air-Trap, that it is free from defects in material or workmanship. If within the 12-month period from the date of the original consumer purchase this product shall prove to be defective, it shall be repaired or replaced at Des Champs Technologies option. Your original receipt of purchase is required to determine warranty eligibility. The warranty does not cover damage due to misuse, misapplication, lack of maintenance, or failure to comply with the manufacturer's installation instructions or recommendations or any other loss or damage exceeding the purchase price of the equipment purchased from Des Champs Technologies. Des Champs Technologies assumes no responsibility for damage or injury resulting from chemical incompatibility between its products and the process fluids to which they are subjected. This warranty is limited to repair or replacement of the P-Series Air-Trap only and is the only warranty issued by Des Champs Technologies on its trap products.

This product design is Patent Pending by Des Champs Technologies, LLC, Natural Bridge Station, Virginia 24579.

Des Champs Technologies has other standard models of traps as well as engineered traps for high temperature, high pressure, and very high water flows. Call 1-540-228-1967 or go to the www.deschampstechnologies.com for more information.

Figure 7 - Use unions to isolate the Air-Trap for removal or for maintenance.

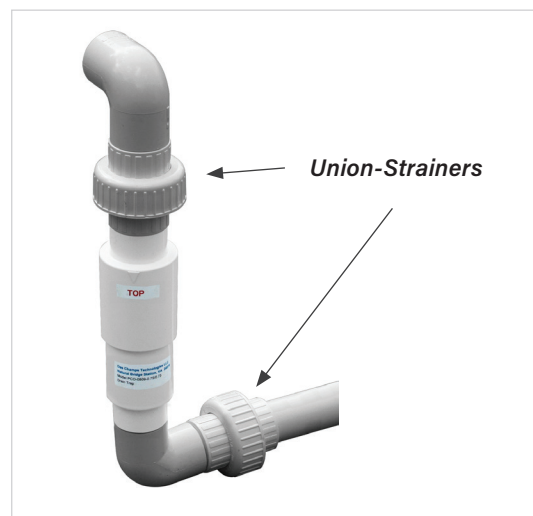
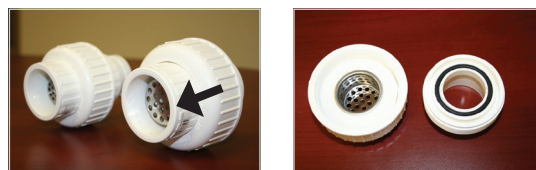


Figure 8 - Des Champs in-line Union-Strainers. Install in the drain line upstream of the Air-Trap. This will aid in preventing debris from entering trap.



The Air-Trap™ concept has been incorporated into IAPMO IGC 196-2018 Standard for Condensate Traps and Overflow Switches for Air-Conditioning Systems.

**Air-Traps meet
IMC® Code Section M307.2.4.1**

ICC-ES Evaluated

