

N-Series: IOM

Negative or Positive Pressure Waterless Trap

Patented

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



Product Description

The N-Series *Air-Trap* allows water to drain from HVAC equipment and simultaneously prevent air from entering the equipment.

The N-Series *Air-Trap* does not require standing water to prevent gas (typically air) from entering the HVAC equipment. With the occurrence of condensate or other water sources within the unit, the water flows out of the HVAC unit but no gas enters. When there is no production of condensate or water there is no water in the trap and there is no gas entering through the trap. **Install the N-Series Air-Trap in a horizontal 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 5**.

Figure 1 - Strainer screen



Negative Pressure Installation

For negative 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 N-Series *Air-Trap* as shown in **Figure 2**. The trap has to be installed level in a horizontal plane with the **arrowhead ► in the direction of water flow**. The vertical distance **X** must be at a minimum equal to the negative plenum pressure in inches of water column. This is a requirement for proper movement of the internal components. **Figure 2** illustrates a 2-inch negative pressure condition.
2. Trap must be installed horizontally only for negative plenum pressure systems. **DO NOT INSTALL VERTICALLY.**
3. The trap must be installed in accordance with manufacturer's instructions and with all applicable local or national plumbing, drainage and mechanical codes. **NEVER CONNECT CONDENSATE DRAIN DIRECTLY TO A SANITARY DRAIN LINE.**

Operation

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

One of the principal advantages of the N-Series *Air-Trap* is that it operates in a horizontal position. This allows the centerline distance between the unit drain connection and the trap to be approximately the same as the negative pressure in inches of water column within the negative pressure plenum. See **Figure 2**.

When there is no water to remove the negative pressure within the plenum draws the internal valve against the valve seat and essentially no air enters the AHU through the drainpipe. When condensate forms then water builds up in the vertical pipe. When the water level equals the negative air pressure, in inches of water column, the force of the water head becomes equal or greater than the negative pressure, the internal valve moves to the right and water flows, as shown in **Figure 2**. When there is no requirement to remove water then the negative pressure returns the internal valve to the valve seat and prevents airflow to the unit plenum. The internal rails aid in returning the internal valve to the seat, especially when a variable speed fan is operating at a low flow and low negative pressure.

The N-Series *Air-Trap* will allow flow of greater than 2 GPM with no external drainpipe restrictions. **Figure 2** illustrates the distance between the unit drain connection and the centerline of the *Air-Trap* is approximately half the requirement of a standard P-trap. Therefore, use of the N-Series *Air-Trap* could be of a great advantage if the height from the AHU drain to the floor or roof is less than required by a conventional "P" Trap.

Positive Pressure Installation

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

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

- Reduces sludge buildup that normally accumulates in standard "P" trap
- Prevents water blow out when condensate begins to form at the beginning of cooling season when trap has dried and air is rushing into HVAC unit plenum, causing water spray into fan plenum compartment
- Since there is no water in the trap, there is no chance of freezing during cold periods.
- Reduces the trap height by approximately 50% as compared to the "P" trap

Figure 2 - N-Series Air-Trap negative pressure installation

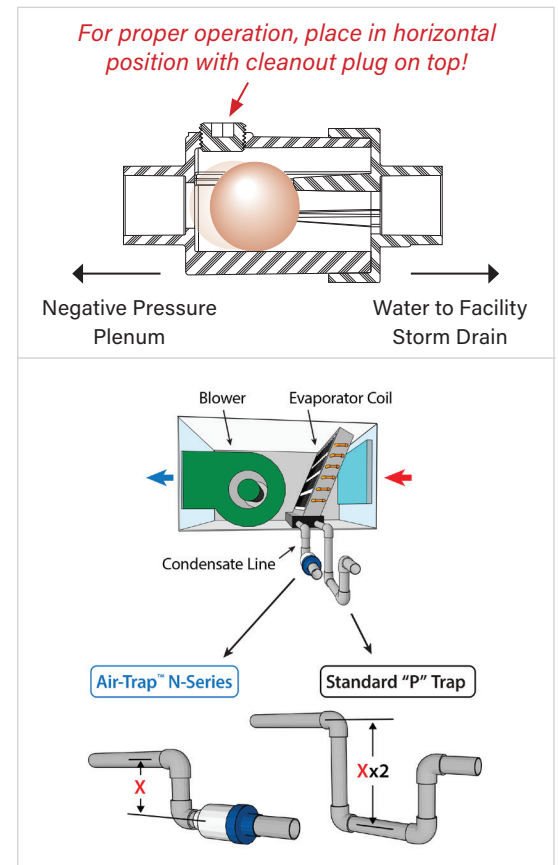
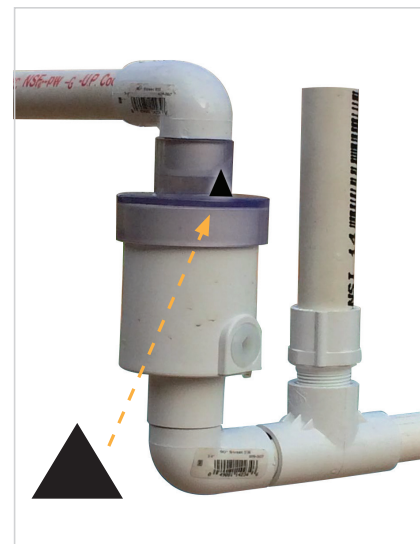


Figure 3 - N-Series Air-Trap positive pressure orientation is vertical



Techniques for Cleaning the N-Series Trap

In some operations, particulate matter may move from the HVAC unit through the drain line and into the N-Series *Air-Trap*. The accumulation of particulate matter in the trap may potentially cause the trap to operate less efficiently or fail. Therefore, a means to remove the debris is required. A stainless steel filter screen over the drain inlet or a *Union-Strainer™* within the drain line and upstream of the *Air-Trap* extends the time between maintenance but more than likely the time will come.

There are several 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 2**

Option 2, shown in **Figure 4**, is to isolate the N-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 5**). The DCT *Union-Strainer* is also a convenient way to prevent unwanted creatures from entering the terminus of the drain line, like snakes, rats, lizards, and insects.

The water flow is in direction of arrow shown in **Figure 5**, with the strainer cup oriented to capture debris within the cup.

Maintenance

Inspect the N-Series *Air-Trap* on an annual basis; remove any sludge or foreign materials that might obstruct proper operation of the valve contained within the trap or general drainage of the drain line. Remove obstacles utilizing the clean out port located on the top of the *Air-Trap* or in the drainpipe. Caution - do not damage the internal valve inside the N-Series *Air-Trap*. Properly dispose of any contaminated materials.

Limited Warranty

Des Champs Technologies warrants to the original consumer purchaser ("Purchaser") of its product, the N-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 N-Series *Air-Trap* only and is the only warranty issued by Des Champs Technologies on its trap products.

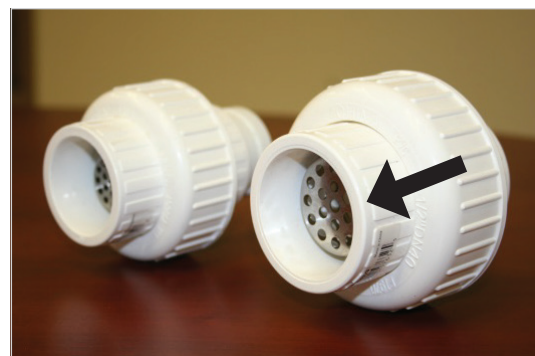
This product design is Patent Pending by Des Champs Technologies, LLC, Natural Bridge Station, Virginia 24579.

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 4 - N-Series Air-Trap with Unions



Figure 5 - Des Champs Union Strainers



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

