HVAC Air-Trap™ **RLC-Series**

Installation, Operation and Maintenance Manual

WATERLESS HVAC CONDENSATE TRAPS

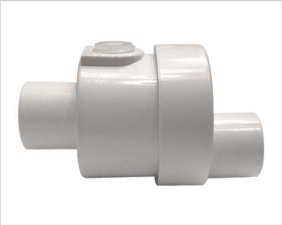
Made in U.S.A.

RLC-Series: IOM

Positive/Negative Pressure Waterless Trap

Patented

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



Product Description

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

The RLC-Series *Air-Trap* does not require standing water to prevent gas (typically air) from entering or 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 flows past the trap. When there is no production of water, there is no water in the trap and there is no gas passing through the trap. ***Install the RLC-SERIES Air-Trap in a vertical position for positive pressure and in a horizontal position for negative pressure.***

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.

Positive Pressure Application

The RLC-Series maximum operating positive pressure is 3.0 inches WC. If the positive pressure is expected to be greater, then a P-Series *Air-Trap* for up to 12 inches WC or an engineered *Air-Trap* for any positive pressure above 12 inches WC should be used.

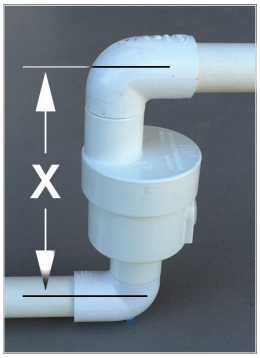
Always connect the drain line leaving the drain pan directly to a trap to ensure proper drainage of water while simultaneously preventing unwanted air from entering or leaving the HVAC equipment.

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

Important: If there is a possibility of items such as screws, gravel, etc. falling into the drain line then install a strainer screen, as shown in ***Figure 1*** over the drain inlet prior to operation of the HVAC unit and before installing the trap. An integral Union-Strainer (also available from Des Champs Technologies LLC, see ***Figure 5***) may also be inserted in the drain line upstream of the *Air-Trap*.

Figure 1 *- Strainer screen*

Figure 2 *- RLC-Series Air-Trap installed vertically for positive pressure application*



1. Install the RLC-Series *Air-Trap* vertically with the embossed arrowhead ▲ pointing upward (see ***Figure 4***). 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.
4. Connect only to a storm drain or a condensate drain line. This product is to control flow of condensate produced by HVAC equipment and is not to be used on kitchen sinks, showers, or in any application where a fan is not creating a negative or positive pressure.

DES CHAMPS Technologies®

2 Nikki Lane
Natural Bridge Station, VA 24579
Phone: 540.228.1967
Fax: 540.291.1270

info@deschampstechnologies.com
www.deschampstechnologies.com
www.waterless-trap.com

Operation in Vertical, Positive Pressure Mode

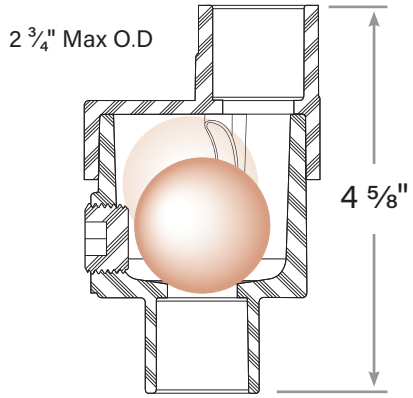
The RLC *Air-Trap* operates dry when no water removal is required and wet when it is required. When dry, essentially no air exits the HVAC unit. When removing water, the water exits the unit, but essentially no air exits the unit through the drain connection.

Install the *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 RLC Series *Air-Trap* accomplishes the following:

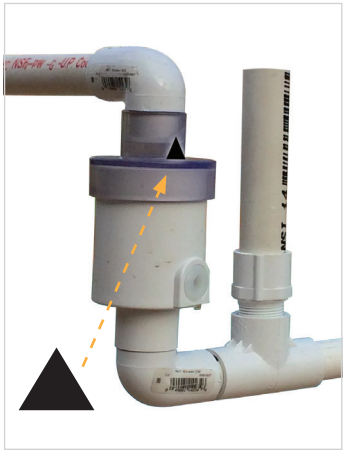
- Reduces sludge buildup that normally accumulates in standard P-traps
- Prevents freezing of trap during cold periods since during periods of no water removal there is no water in the trap. If, for some reason, water is flowing from the unit during freezing temperatures, and the trap is located within this freezing temperature region, then the trap will require thermal protection.
- RLC-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 *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 which totals 6 inches. See ***Figure 2***.
- Eliminates air escaping from an HVAC unit that would result when a standard P-Trap experiences 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 vertical vent pipe as close as possible to the bottom of the trap (see ***Figure 4***).

Figure 3 *- RLC Air-Trap - up to 3 inches of positive pressure at ½ gallon per minute of condensate flow*



Positive pressure orientation

Figure 4 *- Installation of a Vertical Vent Pipe installed directly downstream of a positive pressure trap to prevent a suction pressure that could develop depending upon the length of drainpipe, the diameter, and the water flow rate.*

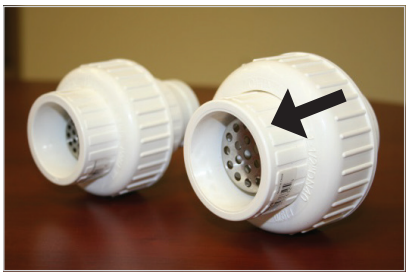


Maintenance and Techniques for Cleaning the RLC *Air-Trap*

Preventative Maintenance

In some operations, large particulate matter can move from the HVAC unit through the drain line and into the *Air-Trap*, causing a malfunction or failure. The best way to reduce maintenance is to install a strainer screen at the inlet to the drain line (***Figure 1***) or a Des Champs *Union-Strainer*™ upstream of the *Air-Trap*, (See ***Figure 5***) to prevent miscellaneous items like, rocks, screws, and nuts from ever getting into the trap. The *Union-Strainer* is also a convenient way to prevent unwanted creatures and objects from entering at the terminus of the drain line, like snakes, rats, lizards, insects, and plant growth. The water flow is in direction of arrow shown in ***Figure 5***, with the strainer cup oriented to capture debris within the cup.

Figure 5 *- In-line Union-Strainers. Install in the drain line upstream of the Air-Trap. This will aid in preventing debris from entering trap. The arrow shows the direction of water flow, into the strainer basket.*



2 Nikki Lane
Natural Bridge Station, VA 24579
Phone: 540.228.1967
Fax: 540.291.1270

info@deschampstechnologies.com
www.deschampstechnologies.com
www.waterless-trap.com

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

Option 2 would be to isolate the *Air-Trap* using unions that allow *Air-Trap* removal for cleaning.

Negative Pressure Application

When operating with a negative pressure plenum, install the RLC *Air-Trap* in a horizontal orientation with the arrowhead ▲ pointing in the direction of water flow and the clean out plug facing upward as shown in ***Figure 6***. Condensate enters the end of the trap with the centered connection and leaves the trap that has the off center connection.

The benefits and maintenance of the RLC *Air-Trap* when used in the negative pressure mode are the same as for the positive mode with the added benefit that it eliminates the geyser effect that is caused when the standard P-Trap dries out and condensate begins to form. The geyser effect is when air rushes into the HVAC unit and does not allow the condensate to drain, causing water to blow throughout the plenum compartment. In addition, the RLC negative *Air-Trap* requires less than half the height of a P-Trap. Dimension **Y** in ***Figure 6*** illustrates that the total height of the *Air-Trap* is only the height of the negative pressure plus one inch and not 2 times negative pressure plus two inches. Dimension **Y** in inches is = negative pressure in inches of water column.

Limited Warranty

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

This product design is Patented 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.

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

ICC-ES Evaluated

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

Figure 6 *- Installation of the RLC for negative pressure showing arrowhead pointing in direction of water flow. RLC traps tested at 1.6 GPM of condensate flow.*

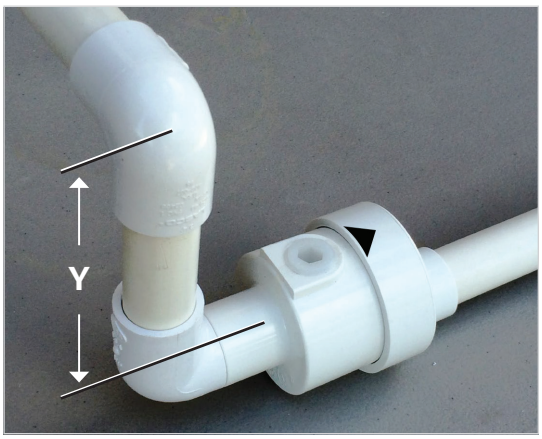
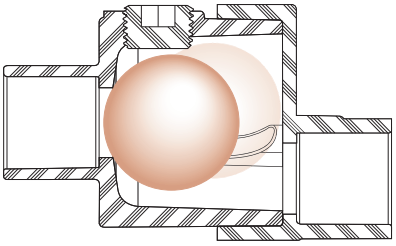
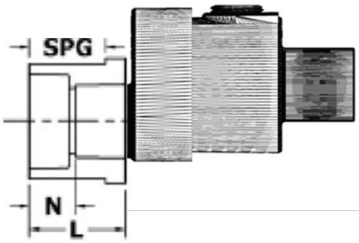


Figure 7 *- Orientation for negative pressure after installation of RLC Air-Trap, showing cleanout port on top, condensate entering at left end center, and exiting at lowest point of trap on the right side. No water remains in trap shortly after condensation ceases.*



Negative pressure orientation

Figure 8 *- The standard connection is 3/4" slip. The O.D. of the connection accommodates a 1-inch bushing. Therefore, any size PVC SCH 40 pipe from 1/2 to 2 inches connects with the aid of a bushing.*



2 Nikki Lane
Natural Bridge Station, VA 24579
Phone: 540.228.1967
Fax: 540.291.1270

info@deschampstechnologies.com
www.deschampstechnologies.com
www.waterless-trap.com