CostGard™

Condensate Drain Seal

for

Blow-Through HVAC Systems

SUBMITTAL

Trent Technologies, Inc.
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BLOW-THROUGH HVAC SYSTEMS

GENERAL

In blow-through type HVAC systems, unlike draw-through systems, the fan blows air through cooling coils creating a positive pressure (above ambient) in the drain pan. Positive pan pressure is favorable to condensate removal, and the ingestion of outside air through the drain line is not possible. But, control of condensate flow is essential. As in draw-through systems, a condensate trap is unsuitable for this purpose. It is subject to: dry trap syndrome, trap flow blockage, and freeze-up in outside locations.

During non-cooling periods when the trap is dry (dry trap syndrome), a relatively large quantity of air may be discharged through the trap. Depending upon the drain size, this could compromise the overall efficiency of the HVAC system.

In addition, during start-up for cooling—when the trap is empty—the discharged air often reaches velocities sufficient to entrain condensate in droplet form and spread it to unwanted places. The velocity at which condensate begins to entrain is about 1600 feet per minute (fpm). The velocity of the air discharged from an empty trap is usually above that value. For example, at a pan pressure of 1 inch of water (a minimum value found in practice), the air velocity of discharge is about 2500 fpm. At 5 inches of water, the velocity approaches 6000 fpm (near hurricane velocity). At best, the resulting wetness creates a nuisance and at worst, it may cause wet floor accidents, property damage and contamination of local surfaces.

Like a trap on a draw-through system, the blow-through trap supports algae growth and collects other debris which cause frequent flow blockage, condensate pan overflow, and associated property damage. In cold climates, traps placed in outside locations can be damaged by freezing temperatures and their effectiveness is destroyed. The result is an empty trap and the problems discussed above.

SOLUTION

A simple solution to blow-through trap problems is the CostGard™ Condensate Drain Seal. It eliminates the problems caused by the condensate trap. It is simple, compact, and self-cleaning. It has no moving parts and is virtually maintenance free. Installation requires a single connection to the AHU condensate drain outlet.

How the system operates can be explained by referring to Figure 1. Condensate and air (two-phase flow) leaving the drain pan enters Part A. Both fluids then pass through the mitered elbow array into Part B. From there, the condensate and a portion of the air pass to the drain outlet and on to the condensate disposal place. The remainder of the air passes into Part D and out through the vent. As the fluids pass through the mitered elbows, there is little resistance to condensate flow.

Indeed, condensate flow is accelerated by the air flow and flows freely through the system. At the same time, these elbows restrict airflow such that the velocity leaving the unit is far too low to cause entrainment and blowing of condensate. In addition, the air turbulence in the mitered elbows creates a scrubbing effect which prevents blockage by debris and algae growth.

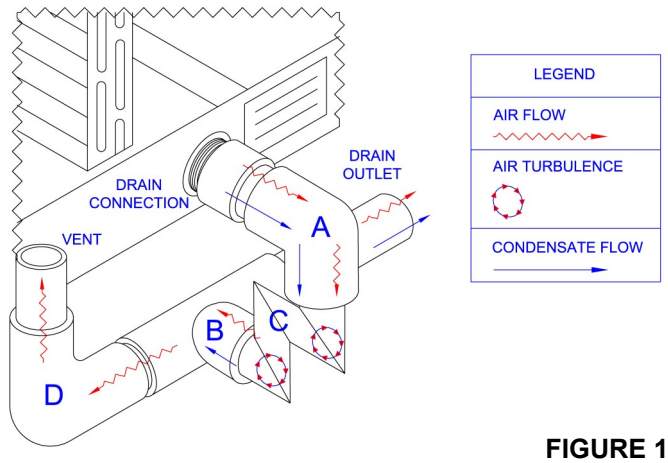


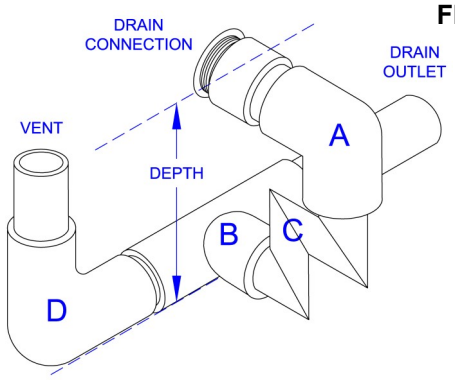
FIGURE 1

PRODUCT

The CostGard™ Condensate Drain Seal is applicable to blow-through AHU systems with: (1) drain diameters of 3/4 to 2 inches; (2) cooling capacities up to 100+ tons; and (3) drain pressure to positive 5 inches of water gage (wg).

The system is configured to minimize the space required for installation. Figure 2 defines the depth occupied by each drain system. The configuration in Figure 2 is near optimum for minimum space. Experience indicates these are suitable for most installations. However, if this configuration is not suitable for a specific application, other arrangements are possible. Since each drain system is custom built, special configurations are generally provided at no additional cost.

FIGURE 2

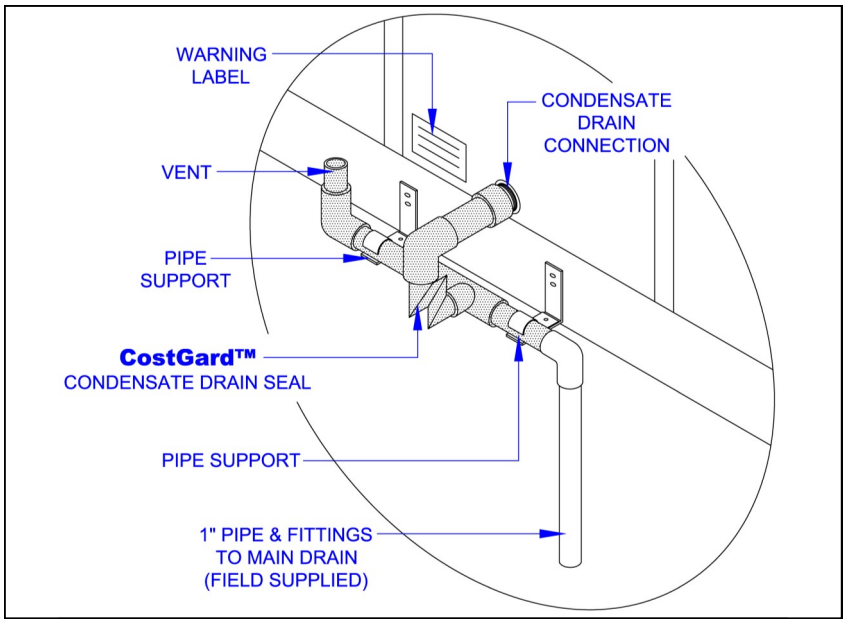


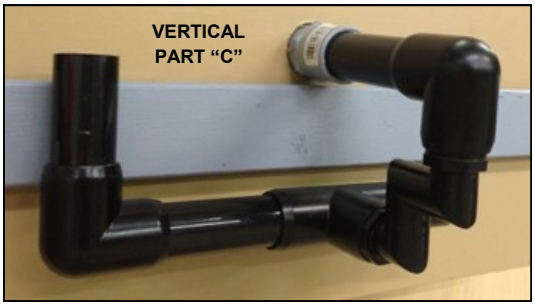
DRAIN SIZE	DEPTH	MODEL #
3/4”	4-1/4”	B50-07-42
1”	5-1/4”	B50-10-52
1-1/4”	5-1/2”	B50-12-55
1-1/2”	5-1/2”	B50-15-55
2”	5-3/4”	B50-20-57

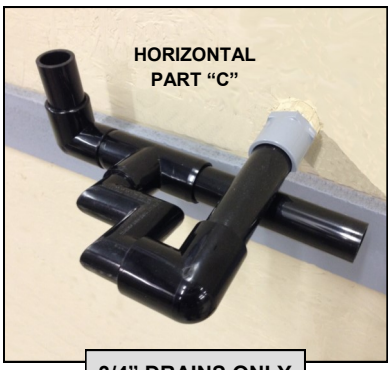
Depth = From the center of the drain to the bottom of the device.

The photographs and drawings in Figure 3, below, illustrate possible installation arrangements.

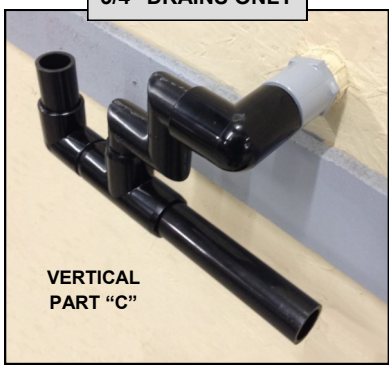
INSTALLATION EXAMPLES







3/4" DRAINS ONLY



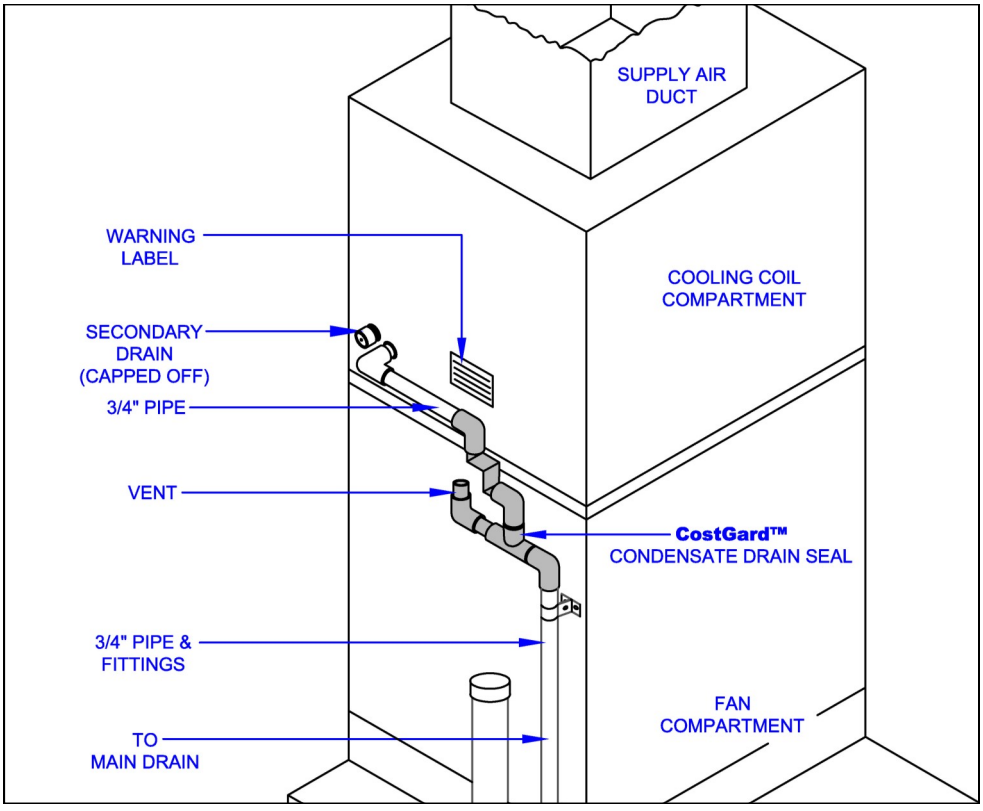


FIGURE 3

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