The University of Georgia

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Poultry Housing Tips

New Four Way Attic Inlet...A First Look

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Figure 1. New attic inlet in closed position.

Figure 2. New attic inlet partially open.

There is a new four way counter-weighted attic inlet (Eagan Sturdy Seal) that is very different from those traditionally installed in poultry houses (Figure 1). One of the things that makes the new inlet so different is that inlet openings are not created by individual counter-weighted blades, but by the entire bottom of the inlet as it drops vertically away from a 2" tall insulated box frame (Figures 2 and 3). The amount of opening is controlled by a single adjustable counterweight and comes preset to begin opening at a static pressure of approximately 0.05" (Figure 5). As the pressure increases, the bottom of the inlet drops further from the box frame, creating a larger and larger inlet opening. The inlet opening is limited to approximately two inches which minimizes the possibility of the creation of harmful drafts regardless of the pressure at which the inlet is set to operate. The new inlet is specifically designed so that all four sides always open the same amount (even when installed in a sloped ceiling), helping to ensure that fresh air is distributed uniformly throughout a house.

Figure 3. Smoke test of new four-way attic inlet.

To minimize heat loss as well as reduce condensation problems the attic new inlet is more heavily insulated than traditional four way attic inlets. The bottom board, as well as the box frame to which the bottom board closes snugly against, is constructed of 1" polystyrene insulation board covered with PVC plastic (Figure 4).

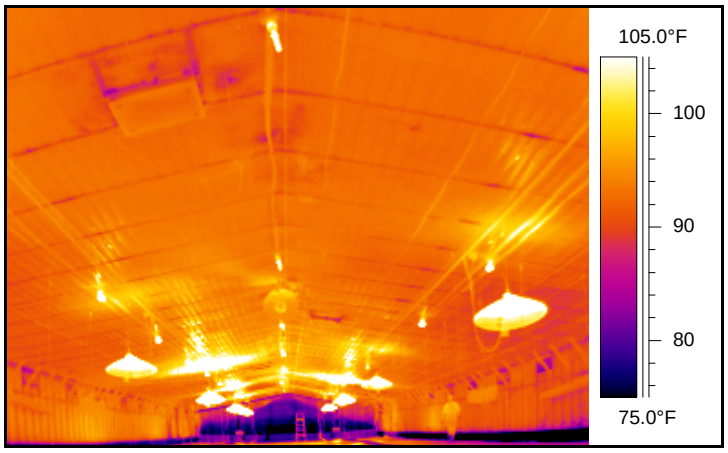

Figure 4. Thermal image of the ceiling of a house equipped with the new attic inlets (attic inlet is in upper left corner).

A common concern with any counter-weighted attic inlet is the ability to close them when not in use. With the new inlet a string can be attached to the counterweight and simply led to the side wall so that individual inlets can be closed or the inlet strings can be attached to a cable so that they be closed through the use of a single hand winch or machine (Figure 5). Another unique feature of the new inlet is that if a producer wants to control the inlets through the use of an inlet machine/environmental controller (rather than using the counterweight), the counterweight can be used to hold the bottom tightly closed against the frame and the machine will pull the inlets open. This is a significant advantage over most inlets where the inlet machine pulls the door closed. When an inlet machine pulls an attic inlet closed, if the inlet strings are not perfectly adjusted individual inlets can remain open, allowing warm air into the attic space. With a counterweight on each inlet forcing the inlet closed, the inlet machine can be easily set so that it allows extra cable to be let out after the inlets are "closed," thereby assuring that all the inlets are in fact closed.

Figure 5. Attic inlet's counterweight

One challenge with designing a counter-weighted inlet is making sure that it will open the same amount every time at a relatively low static pressure (0.05" - 0.07"). A second, is that it closes snugly when the fans are not operating. These design goals become very difficult to achieve when dust accumulates on the inlet surfaces, thus possibly throwing off the delicate balance of the counter-weight system. The designers of the new attic inlet have addressed to some extent the issue of the dust accumulation by making sure all the surfaces of the inlet are fairly well insulated. The most significant cause of dust accumulation on attic inlets is condensation. Dust particles in the air tend to become stuck to condensation laced surfaces. Over time, if not cleaned, the added weight of the dust can throw off the balance of a counter-weighted inlet. The well

insulated surfaces will not eliminate the possibility of condensation forming on inlet surfaces, but should hopefully keep it to a minimum, and therefore dust accumulation, to a manageable level. Furthermore, the smooth, simple exterior of the inlet facilitates quick and easy cleaning, which should also lessen the issue of dust accumulation.

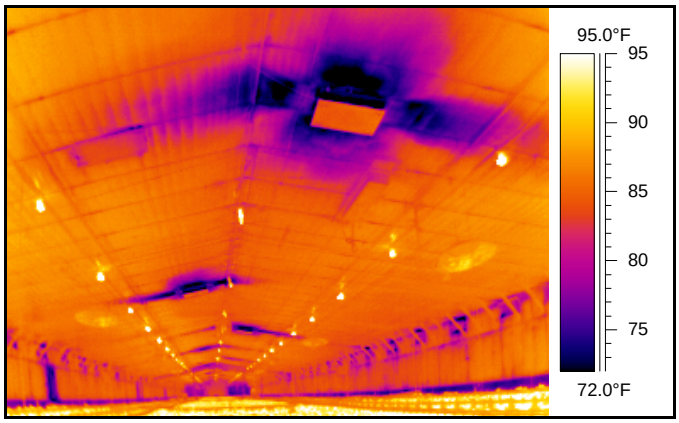

Figure 6. New Eagan attic four way attic inlet.

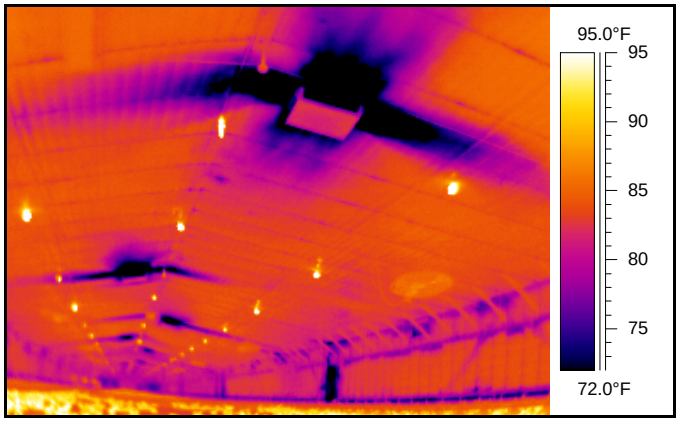

Figure 7. TJ4200 four way attic inlet.

The new attic inlet has been undergoing field testing for the past few months and to date has functioned very well. The air jets emanating from the new inlet are a little weaker than traditional four-way inlets (TJ4200) but smoke testing, thermal imagery, and temperature recordings have not shown this to be a problem (Figures 6 and 7). One of the biggest unknowns with the new attic inlet, as is the case with any counter-weighted inlet, is whether they will require excessive labor to keep them opening and closing the same. So far, the inlets have not required any adjustments, but as with most things, only time will tell.

Michael Czarick
Extension Engineer
(706) 542-9041 542-1886 (FAX)
mczarick@uga.edu
www.poultryventilation.com

Brian Fairchild
Extension Poultry Scientist
(706) 542-9133
brianf@uga.edu