

There is one thing in your restaurant that never sleeps. It works all the time whether the dining room is packed or quiet as a ghost town. Is it the manager? No, even she gets a break every once in a while. Give up? It is the fans inside your walk-in refrigerator and freezer. The motors that turn those fans are perpetually spinning – using the same amount of energy 24 hours a day, 365 days a year. No other load in your kitchen is quite as persistent as those fan motors!

WHAT DO THEY DO? WHY DO THEY DO IT?

Here's the one thing you truly need to know about refrigeration: it is the act of removing heat from air. This is how it works. The fans in your walk-in draw air across the back of an "evaporator" - a long thin tube full of very cold refrigerant. Some of the heat that is in the air gets transferred to the refrigerant, which evaporates and is sucked out of the box taking the heat with it. The air, now minus some heat, comes blasting out of the front of the evaporator and voila, you have refrigeration! There is always some heat that needs to be removed so those "evaporator" fans have to run all the time in order to ensure that your walk-ins maintain the proper temperature. The downside of course is that an inefficient evaporator fan motor is relentlessly wasting your money! Guess what – most of them are inefficient.

ELECTRONICS TO THE RESCUE

The job of a motor is to convert electricity into motion. Many motors are still relatively primitive in design and the conversion efficiency of the smaller ones can be pretty low. To improve these motors, engineers decided to try out some electronic controls and ended up creating a new class of motors called "electronically commutated" or ECM. These motors are about three times more efficient and they are perfect for your walk-ins!

HOW MUCH WILL YOU SAVE?

Let's shed all this theoretical discussion and get back to the point – how much will these motors save you? Here's an example based on testing performed at the Food Service Technology Center. The standard-efficiency, shaded-pole, evaporator fan motors in the FSTC walk-ins were drawing 135 watts each. They were replaced with ECM motors that did the exact same work but drew only 45 watts each. That's 90 watts of fan energy saved and it is also 90 watts of heat that does not have to be removed by the evaporator! Annual cost savings per motor total about \$200 and since these motors only cost \$150; they paid for themselves in less than a year.

THE FINAL ANALYSIS

The FSTC example is based on a small walk-in with only two evaporator fans and the annual cost savings don't justify the hassle factor of removing and replacing existing motors in good working condition. But, those existing motors will fail, and that's when installing the ECM motors is a slam-dunk. It also makes sense to specify ECM motors in any new walk-ins that you plan to purchase. And, if you have a larger facility with multiple walk-ins and 4 or more fans on each evaporator, then it starts to make economic sense to actually retrofit the existing working fans with the ECM fans. After that, you can sleep a little easier, knowing that you are saving money all day – every day!

These energy saving tips are offered by the Food Service Technology Center (FSTC), an unbiased food service resource center located in San Ramon, CA and funded by California utility ratepayers under the auspices of the California Public Utilities Commission. For more information on the FSTC and for our schedule of free energy efficiency seminars, please visit our website at www.Fishnick.com.