

Don't Sweat It

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Prepare your HVAC system for the summer

With summer just around the corner, your HVAC system should be ready to handle the heat without blowing your operating budget.

Restaurant facilities present unique challenges for HVAC system selection because of the demands of the kitchen. How air is handled in the kitchen affects comfort levels and air quality throughout the building. There is no one-size-fits-all solution, but considering the fundamentals and interrelated parts will help you get the most from your capital expenditure while minimizing operating and energy costs during the sweltering summer heat.

Keeping your facility cool in the summer without cooling off profits requires:

- Wise selection when choosing a system suitable for your facility
- Being aware of common problems and how to address them
- A rock-solid and comprehensive preventive maintenance program
- Maintaining building balance so negative building pressure doesn't impact your brand, customer comfort or system efficiency

Choosing a System

Ventilation equipment can be some of the most expensive equipment in a commercial kitchen. In addition, a restaurant's HVAC system can account for as much as a quarter of a restaurant's total energy usage. Getting the best bang for your buck is the key.

Local code dictates system requirements, and the path for new construction versus replacement is very location specific. A new purchase is easier because you do not need to match up any ductwork or unit space. When replacing a unit, it is more economical to match up. Since every vendor offers different air transitions, sticking to the same brand will help you keep similar airflow designs and reduce cost.

The type of restaurant location will impact the tonnage unit choice. According to Dominic Talavera, Vice President of Development at Johnny Rockets, food court locations require different configuration and less units than their standalone buildings.

HVAC systems introduce outside air to the building system. During the heat of the summer, this means hot and humid air in all but the driest desert locations. Assess how different units address temperature and humidity, particularly in the kitchen environment. Duct sizing and unit design should reduce kitchen airflow while ensuring variable exhaust can handle the cooking loads effectively.

Buying direct from the factory offers considerable savings. When dealing with units plus installation that cost, on average, \$11,000, buying direct helps every dollar count.

Warranty terms and conditions factor into overall operating costs. You will mostly find five-year compressor/10-year heat exchanger warranties, while some manufacturers offer 10 year parts and labor on all components. Considering that a 15-ton unit can cost \$5,000 or more to replace a compressor, it is important to factor total cost of ownership into your decision-making process (not just initial cost to purchase and install). Fifteen years is considered a good life span for a unit with proper maintenance.

Common Problems

The most common problems seen across facilities include:

- Ensuring preventive maintenance is performed in a timely and thorough manner
- Employee turnover and staff who fiddle with the pre-set thermostats. (Many facility managers lock down settings to prevent this)
- HVAC system chugging along under load of extreme conditions but not working effectively
- Maintaining positive building pressure
- Insufficient make-up air not creating appropriate capture and containment
- Misplaced hoods
- Blocked drains creating water leaks, backups, inefficient cooling/ heating and not enough air blowing
- Decrease in profits due to customer discomfort, reduced staff productivity, and excessive energy costs
- Condensation from excess humidity and heat during summer months when system is not properly balanced

Customer comfort is a critical factor in the dining experience, especially during the sweltering summer months. Air temperature matters and planning for the peaks and valleys of the day can go a long way toward operating efficiency and customer comfort.

Preventive Maintenance

Good preventive maintenance over the long haul typically extends the life of the unit by 30 percent. Maintenance and testing should occur in early spring. It should include a full test of the system to ensure air conditioning is operating within an acceptable temperature tolerance and is functioning fully. You don't want to find out during a heat wave that the A/C is on the fritz.

The HVAC system is often out of sight, out of mind. Since it is one of the easiest things to maintain on a regular schedule, yet is expensive to replace, making it a priority is important.

A good preventive maintenance program will run quarterly and includes:

- Cleaning and changing filters
- Inspecting, tightening and replacing belts
- Lubricating moving parts
- Checking temperature of pipes
- Inspecting ductwork (and calibrating when necessary)
- Deep cleaning of the HVAC coils. Use a non-caustic and biodegradable coil cleaning solution/foam to ensure it penetrates deep into the coil system. Avoid high-pressure washes as they only clean the surface and can damage delicate coils.
- Performing spring and fall startups so you know your system is working efficiently before that first super-hot or super-cold day of the season.

Regularly replacing air filters prolongs the life expectancy of an HVAC unit. Choice of filters can impact operating costs. Pleated filters capture allergens better and tend to keep the coils cleaner, extending the life of the more expensive moving parts of the HVAC system.

As with many maintenance-related activities, Bob Fonville, CRFP, Director of Facilities at Fuddruckers, Cheeseburgers in Paradise and Luby's, follows a quarterly maintenance schedule and recommends a system of checks and balances. He labels filters and other parts with initials and dates to ensure technicians are replacing them each time. He also asks technicians to show him the filters that have been replaced to ensure no one tries to cut corners. Building a long-term relationship with your vendor can help make this extra check and balance part of a day's work versus a way to police the job.

Maintenance is essential, and Talavera explained that for many of his locations, he follows a seasonal, twice-a-year routine. But high-volume locations are serviced every four months.

In choosing a preventive maintenance technician, look for someone who is qualified, local and reliable. Fonville chooses technicians with 20 years of experience because longevity is important to him. But mostly, with local companies he feels confident in their knowledge of local codes and assured that work is not subcontracted.

Keep in mind during the preventive maintenance cycle that any renovations or additions to your restaurant can potentially throw everything off balance when it comes to the indoor comfort of your space. Adjustments to your ductwork may be required in order to ensure the right amount of airflow is reaching the dining room.

Cost Implications of an Unbalanced Building

One of the biggest energy and money pits as it relates to HVAC performance is building balance. A building should have a positive pressure. Ideally, you are seeking net 5- to 10-percent positive.

In restaurants, one of the culprits of unbalanced building conditions is when kitchen exhaust fans are not set up or operating properly. A lack of make-up air to the fan in the kitchen can throw the entire building out of balance. In a commercial kitchen this problem can exponentially affect HVAC because of the demand, size and number of kitchen exhaust requirements. In the summer, an unbalanced fan exacerbates the high humidity problem, particularly in places such as oceanfront restaurants.

A building that is unbalanced (negative pressure) will exhibit one or more of these symptoms:

- Humidity
- Doors hard to open
- Too cold in summer/too hot in winter
- Backdrafts
- Poor smoke capture by the hood systems
- Condensation dripping
- Complaints from patrons
- Drafts
- Odors

Even the best HVAC system cannot overcome an unbalanced environment, resulting in higher utility costs.

Data from the 2012 RFMA webinar, "How Buildings Breathe" by Charles Dugo with Bloomin' Brands and David Harrison with D R Management Enterprises, finds the following quantifiable impact on this increase in utility costs due to an unbalanced building:

"Our data from more than 1,800 utility bills suggests that electric is inflated as much as 20 percent when operating a restaurant with a negative balance pulling in unconditioned air."

Common causes of an unbalanced building include:

- Equipment deficiency
- Improper calibration and installation/setup
- Deficient preventive maintenance
- Thermostats not programmed properly or frequently adjusted by staff

Installation and maintenance of the HVAC system should ensure it is properly calibrated. Procedural standards for calibration can be found via the National Environmental Balancing Bureau; Associated Air Balance Council; or Testing, Adjusting, and Balancing Bureau.

A successful preventive maintenance routine is imperative. Consider locking down thermostats to set ranges so staff cannot override proven comfort-efficient settings. In many cases all four seasons can be effectively managed in a range of 68-72 degrees without the need to fiddle with the system.

Conclusion

An HVAC system can only be as efficient as the environment in which it operates. Seeking harmony between building balance, system calibration, maintenance and operation will ensure that you minimize operating costs while maximizing energy efficiency and comfort.

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