

Preparing for the Cooling Season



CLS *Facility Services*
Facility Management Solutions

Introduction:

How do you prepare for the cooling season? What are your standard processes and procedures?

Whether you have a detailed plan in place or are just looking for a place to start, this is the e-book for you. We will share specific advice on preparing your HVAC system for cooling system challenges. We will detail strategies for performing an overall inspection of your unit, as well as the proper cleaning of the condensing and evaporating coils. Additionally, we will provide a basic checklist to use during cooling seasons – one that you can and should customize for your specific use.

As with all our e-books, we welcome your feedback and questions. Please do not hesitate to contact us at 800-548-3542.





About CLS:

With experience dating back to our founding in 1970, CLS has proven to be a leader within the facility services industry. Our service providers are ready to help with facility maintenance whenever you require the support, from complete project implementation to everyday repairs. We offer in-depth help to facility managers for the most significant and costly areas of concern.

We invite you to learn more about our industry-leading facility maintenance solutions by visiting our website at www.clsfacilityservices.com or calling us any time at 800-548-3542.

Preparing for the Cooling Season

Different climates present different challenges on HVAC systems in facilities throughout the country. A rooftop unit (RTU) in Phoenix faces extreme desert heat as opposed to a unit in Maine. Yet the need for cooling never ceases. In particular, retail stores use their cooling systems more than they use their heating systems. Even with outside air temperatures between 45 and 55 Fahrenheit, many HVAC UNITS are staying in cooling mode.

A properly cleaned, maintained and balanced HVAC system is a necessity in today's retail setting in order to ensure a pleasant shopping experience for increasingly sophisticated consumers. Good Indoor Air Quality (IAQ) is equally important for proper temperature and humidity in ensuring customer comfort and shopping satisfaction. Likewise, businesses are becoming more aware of the effect of indoor environments on worker satisfaction and productivity as well. Poorly maintained HVAC equipment can impact employee health and productivity, and it can be a factor in losing customers and ultimately, revenue. Therefore, business owners increasingly demand spaces that provide optimal comfort.



At a Professional Retail Store Maintenance (PRSM) conference, Stanley Marcus, of Neiman-Marcus once stated that he estimated the cost of regaining a lost retail customer at \$1,500 to \$2,000. While that estimate may be high for most retailers, it holds truths for owners of not only retail space, but office and industrial as well: Providing a healthy and comfortable atmosphere in retail, office and industrial spaces is vitally important, and can be accomplished through a proper HVAC preventive maintenance program.

The need for cooling never ceases, even in winter. We stressed this point above, and we believe it bears repeating. Your HVAC equipment is vital to the smooth operation of your facility – and your tenants' comfort and satisfaction. It is imperative, then, that you prepare your HVAC system for cooling system challenges, no matter what time of year it is.

As a starting point, we recommend these fundamental steps as part of any preventive maintenance (PM) cooling season program: 1) performing an electrical inspection of the system and 2) cleaning the condensing and evaporating coil.

Electrical Inspection

Through our years of experience in the field, we have found that heating systems generally are more reliable over time than cooling systems. A big reason why is that electrical supplies usually are less taxed in the winter, so units draw less current.



During hot summer months, many communities face “brown outs” which translated, means low voltage. Quoting from an electrical trade school textbook: “Low voltage and single phasing are the two greatest enemies of three phase motors.” Overheating due to low voltage or voltage imbalance will reduce the life of all motors and compressors. “In fact,” says Jean Revelt, Motor Product Manager from Lincoln Electric Company, “...if two motors are operating at a 100 C differential, the one at the higher temperature will have only half the life of the cooler motor.”

Every city, town and state in the country faces the possibility of a brown out. For this reason, we at CLS Facility Services recommend that electrical power wiring be tightened inside the disconnect switch, terminal blocks and contactor as part of regular cooling PM service. Tightening all of connections reduces the resistance of each connection, allowing maximum voltage available to an HVAC unit. A qualified technician will also look for evidence of overheating in the electrical system and correct the problem.

Cleaning the Condensing and Evaporating Coils

Clean coils maximize heat transfer at the coil surface, so it's essential to keep them free of the buildup of all forms of debris that harm efficiency of your equipment. There are three basic ways to clean a coil:

1. The easiest and least expensive way is to brush clean the coil with a soft brush. For comparison's sake, this would be similar to cleaning the lint in a household clothes dryer's metal filter.
2. Second, you can spray the coil with a detergent from a hand sprayer. All coils that are sprayed should be rinsed after spraying, allowing them to stay wet with detergent for 15 minutes or more. This procedure is relatively simple and does not use much cleaning solution. If done regularly in conjunction with a good filter program, you will dramatically reduce the need for pressure washing the coils.
3. Finally, you still can pressure wash coils. Pressure washing equipment is similar to coin operated pressure wand car washing equipment – albeit with significantly greater water pressure. Pressure washing can be expensive, since it is necessary to bring the equipment onto the roof, locate a water supply on that roof, and then secure 110 volts to operate the pump. Pressure washing does the most effective job of cleaning coils, but setting up the equipment is labor intensive and uses more cleaning solution.

Coil Cleaning: Effects on Heat Transfer and Energy Consumption

Both the condensing coil and the evaporator coil in an HVAC unit should be clean at the start of each cooling season. The condensing coil must be clean because it rejects or transfers the heat from the building it is cooling, as well as the heat of compression from the compressor into the air that passes over its surface. This is comparable to the radiator of a car that rejects heat from the engine. The water acts like the refrigerant – again, the heat is transferred to the air that passes over its surface.

The cleaner the coil, the less electric power you must purchase, and the lower compression ratio your compressor will experience. From both an electrical and mechanical standpoint, a lower compression ratio reduces compressor failure. Usually, it is sufficient to wash the coil with a hand sprayer loaded with a properly inhibited alkaline detergent. The detergent also should have a neutral or pleasant smell. We do not recommend “brightening” a coil by removing a layer of aluminum oxide.

To efficiently condition the air inside a commercial space, heat transfer surfaces must be free of dirt and other residue such as biological contaminants. The evaporator coil must be clean, because it absorbs heat from the return air passing over its surface. The cleaner the coil, the more heat it can absorb, thus increasing the overall efficiency of the air conditioning unit.

A clean evaporator coil will reduce electrical consumption and also reduce the compressor compression ratio, leading to longer compressor life. When cleaning the evaporator coil, the first step is to use the same detergent described above for use on the condensing coil. The cleaning solution with a pleasant or neutral odor is now more important than on the condensing coil, because the cleaning solution odor will migrate into tenant spaces. After cleaning the coil with a detergent, rinse and then spray the coil with a sanitizing algaecide.

Next, clean the drain pan and drain line. It may be necessary to run a “snake” through the drain piping or disconnect the piping in order to clean it. Clean the drain pan with a brush, and then flush with an algaecide. Put time-release chemical treatment tablets or a bar in the condensate pan to keep the water flowing.

Earlier in this e-book, we stressed that the need for cooling never ceases. It’s imperative, then, that you prepare your HVAC system for cooling system challenges, no matter what time of year it is. As a starting point, we have recommended three fundamental steps:

1. Perform an electrical inspection of the system;
2. Clean the heat exchanger; and
3. Clean the condensing and evaporating coil.



Now, we're providing you with a basic checklist of steps that can anchor a more customized preventive maintenance (PM) program. We built this checklist with the cooling season in mind; but most elements are applicable for PM throughout the year. As we've said before, your service provider should customize your facility's PM to meet its specific needs.

- Replace all air filters with disposable filters.
- Inspect the blower and replace blower belt(s). You may have more than one stage of heating in your space, and more than one compressor in cooling, but rooftop units (RTUs) only have one blower system. If that blower system doesn't operate, your entire HVAC system is down, which means that you won't be able to heat or cool your space. Most PM programs include belt replacement at least once annually. Your technician should check the condition of the belts, and make adjustments as needed during each visit.
- Inspect the blower bearings, and lubricate as needed.
- Brush-clean the heating, evaporator and condenser coils.
- Verify that the heating/cooling systems are operable (if applicable).
- Check refrigerant levels, crankcase heater, and compressor oil levels.
- Check and adjust all operating and safety controls.
- Utilize megohmmeter testing of motors and compressors.
- Check and record the amp draw on motors, as well as the voltage balance.
- Tighten electrical connections on the unit and inside the disconnect switch.
- Verify that the condensate drain and trap are clean and flowing, and that the condensate pan is clean.
- Verify that economizer dampers are set and operational.
- Have an equipment condition report prepared by your PM contractor – it can be very helpful in long-term maintenance and equipment planning.

You can see that preparing your air conditioners for the cooling season is an involved process. We've said it before, and we'll say it again: In developing a PM program, select a qualified contractor who regularly services your type of equipment and can provide you with thorough equipment maintenance reporting.

Hopefully, this checklist can help facility managers reduce the cost of operating HVAC equipment, increase its reliability, and boost tenant comfort and satisfaction.

If you want to learn more about CLS's national HVAC services call us at 800-548-3542.



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