

Preparing for the Heating Season



CLS Facility Services
Facility Management Solutions

Introduction

Properly preparing for the heating season can be a very rewarding practice for your business in terms of energy and cost savings throughout the season. This e-book takes a closer look at what you need to do to be fully ready when the temperatures drop, including preventive maintenance strategies, heating start-up tactics and energy saving tips.

We hope that you find this information valuable. For more information on CLS and the HVAC services that we provide, visit us at www.clsfacilityservices.com or call us at 800-548-3542 and we'd be happy to help.





About CLS

With experience dating back to our founding in 1970, CLS has proven to be a leader within the facility service 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.

Preventive Maintenance Strategies

It may seem a little odd to begin an e-book titled “Preparing for the Heating Season” by talking about air conditioning. Yet commercial buildings place constant demands on the systems that run them, and air conditioning is no exception. Equally notable, you can learn a lot by evaluating the performance and condition of your air conditioning unit or units at the conclusion of the cooling season – and then use that knowledge to make smart decisions moving forward.

Essentially, when the “panic”, or high-use air conditioning season is over, make sure a qualified technician performs a thorough inspection of each piece of HVAC equipment in your property or properties – and then provides you with a detailed report. This report will give you the necessary information to make informed budget decisions for next year. It also gives you time to prioritize repair and replacement in an orderly manner, thus reducing your start-up cost in the spring.

Because your air conditioning units are only partly loaded at the end of the cooling season, it is conceivable that you have lost capacity and aren’t aware that you have a problem. Performing preventive maintenance (PM) throughout the year – and particularly at the end of the cooling season – can red-flag real or potential problems and enable you to take appropriate action.



Types of Heating

- Natural gas heating, the most common type.
- Electric resistance heating, when gas is not available or electric is not expensive.
- Oil heat, a common heating type in the Northeast U.S.
- Propane heating, in cases where it can compete with natural gas, or in new construction when natural gas is expected later.
- Heat Pumps, particularly in the South.

Preventive Maintenance



Rooftop blower belts tend to break in the winter when they are cold and less flexible. If a unit has been turned off for some time – perhaps on night setback – and then the motor is turned on, that motor will attempt go from 0 to 1,750 RPM instantly. This puts considerable torque on belts and the blower system. After the belt makes a few revolutions, it warms up as it goes around the pulleys. This usually is when cracked belts break.

Most PM programs include a belt replacement at least once per year. The belt's condition should be checked and adjusted on each visit. You may have more than one stage of heating, and more than one compressor in cooling, but rooftop units (RTUs) have only one blower system. If that blower system will not operate, your RTU is non-operational, and it is highly likely that you will be unable to heat or cool your space.

To reduce heating breakdowns, we at CLS Facility Services developed the following basic PM program. We recommend that you use refer to this as a guide, and employ the specific PM program provided by the manufacturer of your equipment, if available.

Heating Start-Up Checklist for a Natural Gas RTU

- Check gas pressure and piping for leaks, and support.
- Replace air filters.
- Inspect the blower and replace belt(s) once per year.
- Inspect the condition of blower bearings and lubricate.
- Inspect the condition of the blower motor and lubricate.
- Brush-clean the heating elements and/or the heat exchanger.
- Test the operation of the heating system.
- Check the condition of the combustion blower.
- Check the pilot or ignition system.
- Check the heat exchanger.
- Check the thermostat and all operating controls.
- Tighten all electrical connections.
- Clean and check all grounded connections.
- Run through two complete heating cycles.
- Verify that the economizer dampers are set and operational.



A Word about Economizers and “Free Cooling”

An economizer is an RTU accessory that allows you to vary the amount of outside or fresh air that you bring into the space you are controlling. In the spring and fall, there are many opportunities to use the outside air to cool a commercial space.

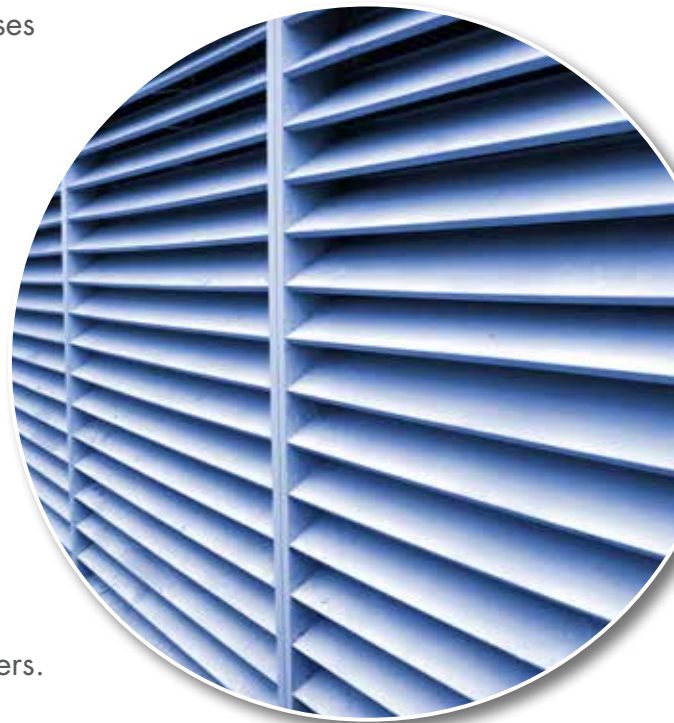
When economizers operate correctly, they provide several notable benefits:

- “Free Cooling.” This really is a misnomer, but it does provide cooling at a much lower cost without mechanical refrigeration.
- An economizer flushes the VOC (volatile organic compounds) associated with new carpeting as well as merchandise in a retail store.
- An economizer provides fresh air with higher levels of oxygen. Casinos, for example, keep their gaming areas filled with fresh air.
- An economizer fills space with a positive air pressure and keeps odors from nearby areas (e.g., food courts and pet stores in malls) from infiltrating your space.
- With an economizer, you minimize the energy used to operate the compressor. You also save wear and tear on the compressor. It is much harder on a compressor to operate in the winter than in the summer. When the outside air temperature drops below 55 degrees, the compressor is stopped, and the commercial space is cooled with outside air.

Conversely, an economizer that does not operate correctly poses several disadvantages:

- High energy cost if the Outside Air (OA) dampers are open in the summer.
- High energy cost if the Outside Air (OA) dampers are open in the middle of winter, and it becomes necessary to run the heater in order to compensate for the improper damper setting.
- Lack of odor dilution, positive pressure, and oxygen depletion if the economizer is closed tightly.

As the heating season looms, now is the time to take advantage of the economizer operation with all of the benefits. In the fall and beginning of winter, you may be heating at night and cooling in the day. Therefore, it's wise to take advantage of the “free cooling” available with economizers.



Heating Start-Up Tips



When the temperature outside drops, the heat is on – literally and figuratively.

For building managers, colder weather signals the time to begin heating the buildings they manage. And heating places unique demands on a building's HVAC equipment. Moreover, the array of system heating sources – natural gas, electric resistance, oil, propane and heat pumps, necessitate different approaches and strategies to start-up, operation – and preventive and ongoing maintenance.

A sound PM program can keep HVAC equipment running smoothly and efficiently during the cold winter months, and all year round as well. In our last section, we provided a basic PM checklist for natural gas heating equipment. Now, we'd like to use that list as a baseline for the other heating sources, and provide add-on tips for each one based on their specific requirements.

Electric Heating

- Replace air filters.
- Check the thermostat operation.
- Check the economizer operation.
- Check the heating elements, the fan proving switch, the sequencers, and the temperature cut out switches, and tighten the electrical connections.
- Check the operating and safety controls.

Oil Heating

- Replace the air filters.
- Check the thermostat operation.
- Check the economizer operation.
- Replace the oil filter.
- Check for water in the tank.
- Check the oil pump pressure.
- Replace the nozzle.
- Adjust the combustion air.
- Check the heat exchanger.
- Check the oil pre-heater, if installed.
- Check the operating and safety controls.

Propane Heating

- Replace the air filters.
- Check the thermostat operation.
- Check the economizer operation.
- Check for propane pressure, leaks and piping support (Propane is heavier than air and can settle into your building if leaks exist)

Heat Pumps

- Replace air filters.
- Check thermostat operation.
- Check economizer operation. Usually, heat pumps use electric resistance heat as a backup or second stage heating source. First check the unit in the heating mode and then the cooling or defrost mode. Verify correct refrigerant charge. Check both inside and outside coil for cleanliness. Determine type of defrost and check operation. In the heating mode heat pumps are especially sensitive to dirty air filters in mild weather.

Consider Radiant Heat Systems As Well

Radiant heating is a type of heating that is gaining popularity, particularly in stand-alone retail stores. With radiant heating systems, plastic piping is installed in the floor of the store or in exterior sidewalks during construction. A boiler and circulating pump are then connected to the piping. The warm floor is a comfortable type of heating, and the water tracked into an interior space is evaporated quickly with warm floors.

If you use radiant heating on your sidewalks, there will be little water or snow tracked into the interior space. Having a safe, dry, ice-free sidewalk encourages more traffic to your space in the winter and rainy season. This, in turn, creates good will that is carried over to warmer months. Radiant heat in sidewalks also reduces liability and labor expense for snow and ice removal.



Energy Savings Ideas

We think there's no better way to save on energy costs, and ensure the smooth, long-lasting operation of your HVAC equipment, than by maintaining a sound PM program for your RTU.

That said, we've learned a trick or two throughout our 43 years in the business, so we wanted to pass along a quick energy saving tip for those cold winter months.

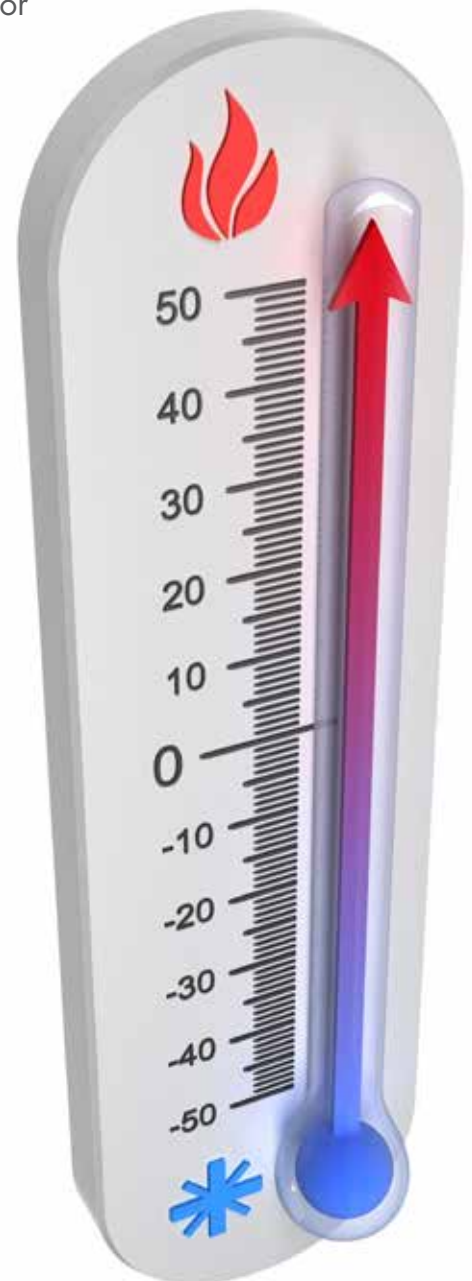
It's logical to assume that an HVAC unit is almost entirely responsible for regulating the internal temperature of a given space. Yet in truth, that space's temperature is affected by the environment and elements – built and otherwise – that surround it. So why not use those variables to your advantage?

Accordingly, we recommend using your night setback thermostat, or turning thermostats down when spaces are unoccupied. This simple act can save 10% or more on heating-related energy costs for your property.

To illustrate this, consider a retail example. In mall configurations, your store may be surrounded by other stores that have only one exposed, or outside, wall. On a cool night, let's say you turn the store's thermostat down to 50 degrees Fahrenheit when you leave. When you arrive the next morning, you check the actual temperature in the store. Chances are excellent that it probably will be above 55 degrees, thus indicating that the HVAC unit did not operate during the night.

So what happened? Well, the stores and malls common areas on all sides of your store actually "leaked" heat into your store. This is thanks to the first law of thermo-dynamics, which states that heat moves from the highest energy level to the lower energy level. It will take a bit longer to reheat your store; but you will save energy in the process.

We hope you found this e-book valuable. It's been our pleasure presenting it to you, and we look forward to providing our insights, strategies and recommendations for other key building systems in your facility.



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Choosing a facilities solutions partner is a crucial choice for your organization. You want someone who understands your equipment and its needs, someone you can trust and customer service that exceeds your expectations. Learn more about CLS at www.clsfacilityservices.com.

