How to Prevent Costly Air Conditioning and Refrigeration System Problems

A loss prevention guide for small systems

Many failures take place early in the cooling season. Most of these accidents could have been prevented if a little more attention had been paid to preparing the equipment for service. The Hartford Steam Boiler Inspection and Insurance Company recommends that the following measures be taken to help ensure a trouble-free start up and reduce the likelihood of equipment malfunction during the cooling season.

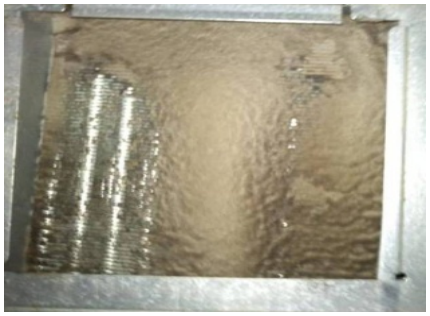
Clean It Up

Condenser Fouling

A dirty condenser results in higher operating pressures, which may shorten the life of the compressor. High operating pressures can also cause refrigerant leaks. Condensers blocked by trash, stored materials or those caked with dirt, weeds or pollen can reduce cooling capacity by 7 percent and increase power consumption by 10 percent according to leading electrical power providers. Keeping these surfaces clean can save hundreds of dollars per year.

All trash and stored materials should be kept at least four feet from the heat exchange coils. The outside fins or coils should be cleaned of all contaminants before start up. All vegetation above lawn level should be removed to at least four feet minimum distance. Damaged coils with bent heat exchange fins have the same detrimental effects on system performance, and need to be "combed" back into line.

Air side filters



Surfaces of the indoor cooling coils also need to be kept clean and free of obstructions. Make sure air filters are properly in place and are changed on at least a quarterly basis. A written log should be placed near the filter area to record the cleaning schedule. This routine maintenance procedure will also improve air quality and the annual energy savings over the heating and cooling system can be substantial.

Green It Up

Refrigerant leaks

System leakage can be 15% of the refrigerant volume every year. This release goes into the atmosphere and contributes to refrigerant pollution.

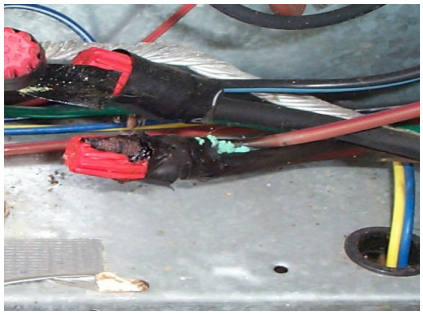
Low refrigerant levels can be determined by viewing a sight glass passing bubbles, low air flow in the "air side" or detected when frost develops on refrigerant piping or indoor coils.

Have a service technician check refrigerant pressures and look for leaks every spring and make all repairs indicated.

Locate qualified local contractors who will provide a seasonal labor warranty as part of the cost of the spring "tune up".

Power It Up

Check the wiring and connections



Qualified technicians should check the power connections for signs of problems or looseness. Common issues arise from off season moisture, physical and rodent damage, or corrosion.

Take insulation resistance readings and verify that resistance is greater than one megohm. This electrical check will improve the reliability of your system and help minimize extended interruptions in cooling due to an electrical breakdown of controls and connections.

Circuit Protection

Over the course of the operating season variations in power quality will happen. Hartford Steam Boiler recommends installing protective devices if they were not originally furnished with the equipment. Devices such as under voltage relays can protect the systems from summer "brown out" conditions. Larger systems which use three phase power can be protected from failure due to "single phase" operation with proper phase protection devices. Temperature monitoring and alarm functions are an inexpensive option that can now be purchased with refrigeration equipment and can alert you prior to a loss.

A programmable thermostat can automatically change your facility temperature to an energy saving level when you are away or closed. This can amount hundreds of dollars per system per year. Installation of programmable thermostats also provides time delay features to reduce the frequency of short cycling. For even better protection install timers set for longer start delays.

Heat It Up

Many commercial compressors have crankcase heaters to maintain proper temperature of the lubricating oil and to eliminate the mixing of liquid refrigerant with the compressor oil. This keeps the lubricating oil from boiling off and leaving the compressor. Crankcase heaters are required year around for equipment protection. These must be operated for 8 hours before starting the system and kept energized all season. So switch on the power and heat it up.

Internal heater

External heater

Regular preventive maintenance will reduce your risks of business interruption and the potential for lost customers. A little extra care can add years to the life of your valuable equipment.

The tips offered here are intended to complement and not replace the original equipment manufacturer's recommendations.

