



## Ken's Korner

### COOLING EQUIPMENT MAINTENANCE CHECKLIST

Proper maintenance of cooling equipment will not only extend their life but also cut operating costs in the data center. Remember cooling cost typically account for 40% of a data centers electrical expenses. Dirty or poorly maintained cooling

equipment will not only decrease your cooling efficiency, contributing to lost capacity, but it also runs the risk of failure leading to outages and downtime.

#### HVAC CRAC/CRAH UNITS

##### While cooling units are still running.

- Start each unit, look and listen for any vibration or unusual noises. Typically this would come from blower motors or misaligned fan belts or compressors. Note any unusual noises, and schedule maintenance to isolate and address these possible problems.
- Always refer to your owner's manual for recommended maintenance, but remember with a goal of 100% uptime, your actual maintenance schedule may exceed that recommended by the manufacturer.
- Prior to shutting down each cooling unit, infrared (IR) scan the unit including its electrical components. Look for hot spots that may indicate loose or weak connections.

##### After shutting down each cooling unit perform the following maintenance tasks.

- I recommend checking all wire terminations to make sure they are tight.
- Lubricate blower motors if necessary. Some units blower motors may have sealed bearings but if you have Zerk fittings on your motors they will require lubrication.
- Clean blower motor fans, dirty fans will decrease CFM output. These can sometimes be hard to get at we used a round wire brush with a long flexible handle on it.
- Inspect cooling unit filters. It is hard to set a timeframe on changing your filters since the interval of changes will depend on your environment. A dirty environment, especially during and immediately following construction or remodeling will require filters to be replaced more frequently.

- Inspect the A-coils and clean if necessary. If necessary straighten bent coil fins with a fin comb. Clean and straight A-coils will greatly enhance heat transfer and increase cooling capacities of your A/C unit.
- Clean both interior and exterior of each unit. Make sure you use a good vacuum cleaner with a HEPA filter to vacuum the inside.
- Check and clean condensation pan on each cooling unit. Though most pans have drains, if you have standing water the drain may be plugged and need cleaning. Standing water in a condensation pan is a breeding ground for bacteria, fungus, and microbes. Use a controlled-released anti-microbial or pan cleaner in the pan every quarter or at filter change time to prevent future fouling or dirt accumulation in the condensate pan.
- If you are using CRAC units with compressors connect gauges and confirm you have proper levels of coolant.
- Amp probe blower motors to ensure they are within nameplate ratings. If the power draw is too high, this can indicate that belts are out of alignment, too tight or that bearings are beginning to fail. This can shorten the life of blower motors as well as adding to operating costs.

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## COOLING EQUIPMENT MAINTENANCE CHECKLIST (CON'T)

### COOLING TOWERS

**I recommend doing this every spring and fall with cooling towers shut down.**

- Check the holding tank in the wet towers and remove all large debris.
- Remove all screens (some people refer to them as air scrubbers) and clean.
- Pressure wash the entire cooling tower.
- Check entire unit for rust. Remove any rust that is not removed from pressure washing.
- Check drains and clean.
- Lubricate all bearings both on motors and belt pulleys.
- Look for excessive belt wear, check belts for alignment and proper tension.
- Check all electrical wiring for loose or discolored connections.
- Check and clean all water nozzles that feed the return condenser water to the towers.
- Inspect the bottom of the towers for any water leaks. Make sure all leaks are repaired.
- Look for excessive corrosion, this could indicate improper chemical treatment program.
- Be sure and clean the area around the cooling towers. Remember they are like big vacuum cleaners that pull outside air into them to cool your condenser water. A dirty environment can impact the efficiency of the cooling system.

**With cooling towers turned back on.**

- Check fans for proper balance. If they become unbalanced, this can place extra stress on motors and bearings.
- Amp probe drive motors for proper readings. You can find the proper rating on the motor nameplate.

### CENTRAL CHILLERS

**While the cooling system is running.**

- Observe the cooling system's operation, listen for any unusual noise.
- Check all electrical wiring, I recommend using an IR (infrared scanner), this will show any loose or overloaded electrical connections.
- Attach A/C gauges and check for proper coolant readings.
- Check and make sure all gauges are in proper working order.
- Check all valves and piping, observe and list any leaks that will require repair or replacement.

**While the cooling system is shut down.**

- Clean all condenser tubes (sometimes referred to as shooting the tubes). This is typically done with a long motorized brush or a water cleaning unit. These units are fairly inexpensive and insure the job is done right. Each tube must be properly cleaned to ensure maximum heat transfer. If they are found to be excessively corroded, you may want to be sure your chemical treatment is sufficient.
  - Consider running a fiber optic camera into the condenser tubes to make sure nothing was missed. If you find excessive corrosion in these tubes, call the chemical company you are using and have them evaluate the chemicals.
- Restart the unit and amp-probe the power feeding the chiller (while under load) to be sure you are drawing proper power (check the nameplate on the unit for proper loads).
- Clean the outside of the entire chiller and the area around it.



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