mechanicalservicecorporation

TECH TALK

MSC - THE ONLY TRUE HVAC SERVICE COMPANY - WE FIX IT

NEWSLETTER - JANUARY 2014

973-884-5000

SERVICE CALLS

Stratification – Freezestat trips are oftentimes the result of poor or uneven heating coil sections, control valve issues, or stratification, which is the tendency of cold air and warm air to separate into layers. Freezestat trips can occur in air handling units when cold outside air and warm return air remain stratified and reach the freeze stat together. A blender should be designed and installed to properly mix the air to a uniform temperature.

Liquid nitrogen cooling – The temperature of the liquefied form of nitrogen is approximately -330F, making it ideal for processes such as chemical reactors and low-temp storage. Liquid nitrogen is run through a heat exchanger and can produce temperatures of -70F and lower (normal mechanical process cooling is usually 5C). In the photo above, a low-temperature process nitrogen skid is used to cool a chemical reactor.

Detecting and Resolving Motor Shaft Voltage

Variable frequency drives (VFDs) used to control the speed and output of motors can generate harmful electrical currents that flow through the shaft and motor bearings. Because VFDs are being used more and more frequently in HVAC, shaft voltage and bearing currents account for a rapidly growing number of motor faults. Shaft voltage can begin to cause bearing damage in as little as one week.

Frosting, fluting and pitting

VFDs are the most common culprit when bearing currents and shaft voltages occur. The high-frequency switches used in VFDs can cause currents that discharge across motor bearings. Though all motor bearings will always carry some current, excessive levels will lead to failure and decreased life span of the motor. Discharge current damage can also extend to the bearings of other equipment connected to the motor shaft, such as tachometers and gear boxes. When noise and vibration are present and excessive shaft voltage is suspected, a specialized device can be used to measure currents. Failed bearings damaged by shaft voltage will show visible signs of frosting, fluting, or pitting of the bearing race surfaces. Frosting is the usual indicator of damage from currents at low speeds, while bearings damaged at higher frequencies tend to show the more severe effects.

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- Defining True Service / Sound Attenuation
- Did You Know - ISNetworld

Prevention measures

Installing a shaft grounding device, which safely channels currents away from bearings to ground, is the best way to reduce VFD-induced shaft voltages. Users can expect normal bearing lifespan, which usually ranges from six to ten years, when using a shaft grounding device. Insulated motor bearings can be installed to stop the flow of discharge current through motor bearings, but they do not prevent damage to other shaft-connected equipment, and in some cases can pose a risk of mild shock when the rotating shaft is touched.

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Humidification

Winter is here, and having the proper relative humidity (RH) levels at home and work environments is very important during these cold, dry months. A properly sized, well-maintained humidification provides numerous health, productivity, and economical benefits.

Relative humidity, the amount of moisture within the air at a given temperature, is a key component of environmental comfort. An RH level of 35% to 40% is ideal for occupant comfort and static control, but certain environments, such as healthcare facilities and certain types of manufacturing, may require higher RH levels up to 55%.

Properly humidified air is healthier and more comfortable than dry air. Outdoor air and infiltration rob indoor air of humidity, causing mucous membranes in the skin, throat, nasal passages, and sinuses to dry out and providing the ideal breeding ground for viruses and bacterial infections. Humidification eases the discomfort from dryness and significantly decreases occupant susceptibility to infection and illness. Also, moist air allows oxygen to be more easily absorbed in our blood system, reducing the fatigue, headaches and lethargy that decrease productivity.

Because dry air feels colder, maintaining proper RH levels helps reduce heating costs. When air is at the proper relative humidity, the rate of moisture evaporation on the skin is reduced, and we feel warmer and more comfortable. Humidified air that is 68 degrees feels more like a comfortable 71, even on the coldest days, enabling you to lower the thermostat and save energy. Other benefits of humidification include: dissipation of static electricity, which causes shocks, interference with computers and office equipment, and problems with static-prone materials; reduction of dust levels; and the prevention of drying and cracking of wood furniture, fixtures and flooring.

There are various types of humidification systems available for different environments and applications. Most are derived from either steam (boiler steam, clean steam, canister steam, etc.) or cold water (centrifugal, ultrasonic, atomized, fogging, etc.). Each has unique advantages, drawbacks, and maintenance considerations, and they vary in energy efficiency. MSC can provide expert selection guidance, installation, preventive maintenance, troubleshooting and repairs for all types of humidification systems. Please contact us at (973) 884-5000 for more information or to assist you with any of your indoor humidification needs.

Fan Wall Technology

In the past, most air handling units had one supply fan and, at times, a return fan. **Nowadays, fanwall technology, which utilizes multiple fans operating in tandem, provides redundant fan control for more-critical HVAC applications.** Fanwalls come with their own control panels and VFDs. If one fan should fail, dampers will isolate that fan and increase the speed of the other fans to maintain static pressure or flow. This technology is often used in industries where HVAC failure is not an option, such as pharmaceuticals, data centers, and microchip manufacturing.

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MSC is an HVAC Service Specialist: Defining "True Service"

At the top of every MSC Tech newsletter is a line that we try to reiterate to our customers as often as possible. It reads "MSC – THE ONLY TRUE HVAC SERVICE COMPANY – WE FIX IT".

So, what exactly does this mean? A common misconception is that MSC is a mechanical contractor, and that all mechanical contractors are basically the same. This, of course, is not the case. Whereas a mechanical contractor's expertise lies in installation, overall maintenance and general repairs, MSC is a service subspecialist in the technical intricacies of HVAC and controls. Our service techs are diagnosticians, specially trained to troubleshoot HVAC systems, provide permanent solutions to puzzling and elusive problems, and identify and correct potential issues before they can occur.

MSC continually invests in state-of-the-art diagnostic equipment and technical training. Our service techs are multi-disciplined, with extensive knowledge of electrical, controls, refrigeration, thermodynamics, etc., and all are UA STAR-certified. MSC holds biweekly workshops where we troubleshoot current projects, share solutions, and discuss new technologies.

People often make the mistake of hiring a mechanical contractor to address issues that require a service specialist. In fact, a good mechanical contractor will recognize complex issues and, rather than attempting ineffective stopgap solutions, will recommend a good service contractor like MSC. When you consider that HVAC accounts for more than 65% of the energy consumed in a commercial building, and the high cost of equipment failure and replacement, making the proper distinction between a mechanical contractor and an HVAC service specialist is extremely important when it comes to maintaining your system and preserving a healthy bottom line.

Sound Attenuation

Though many HVAC designers address noise control as part of their design, it is often missed, underestimated, or value engineered out to save money. As a result, noise can exceed acceptable db(A) levels, a troublesome issue that can be expensive to remedy. When it becomes necessary to add sound attenuators to existing air handlers, exhaust fans, lab supply and exhaust, etc., always opt for professionally-engineered and -fabricated units designed specifically for your particular needs. Sound attenuators can be fabricated by a sheet metal shop, but it is vital to first understand the noise you're dealing with and what is needed to control it.

DID YOU KNOW...

- MSC has received an A rating from ISNetworld. ISNetworld is a global resource for connecting corporationswith safe, reliable contractors in capital-intensive industries.