mechanicalservicecorporation

TECH TALK

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

NEWSLETTER - JANUARY 2015

973-884-5000

SERVICE CALLS

Low exhaust - Above, MSC was called in to troubleshoot a low exhaust airflow condition. Though the exhaust boxes were constant-volume Venturi-style valves, normally very reliable, flow stations were reading low CFM. After some investigative work, MSC technicians discovered and removed latex gloves stuck in the air valve, and the lab was back in business.

Damper positioning - Fresh air intake and economizer cycle functionality require proper actuator control and damper limit switch positioning. Above, several limit switches that had become loose required readjustment and testing to allow the supply and return fans to start and run properly.

Humidification and Absenteeism

Numerous studies conducted over the years reveal a linear correlation between indoor relative humidity and absenteeism. Schools with humidification systems in place have been shown to have absentee rates as much as 40-50% lower than unhumidified schools, and statistics for office space are similar. These statistics only hold true, however, when proper HVAC system maintenance is in place, as dirty or standing water may lead to microbial growth.

During dry winter months, heating systems rob indoor air of humidity, causing mucous membranes in the skin, throat, nasal passages, and sinuses to dry out, providing an ideal breeding ground for viruses and bacterial infections. Maintaining an indoor RH level of 35-40% (or higher, depending on the environment and building use) can significantly decrease occupant susceptibility to infection and illness. Humidified air also allows oxygen to be more readily absorbed in the blood system, reducing fatigue, headaches, and lethargy that can decrease student and worker productivity.

INSIDE...

Because dry air feels colder, maintaining proper RH levels can help reduce heating costs. Properly humidified 68-degree indoor air feels three degrees warmer to building occupants than unhumidified air maintained at the same temperature. Other benefits of humidification include reduced static electricity and dust levels and the prevention of drying and cracking of wood furniture, fixtures and flooring.

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LAB: Project Report

The Fiber Tower is a four story room within a lab facility. The building construction is steel frame on a concrete slab with additional floors being poured concrete on corrugated decking. The two exterior walls in the fiber tower room are block walls with large glass window arrays. The two interior walls are conventional sheetrock walls that run from the floor to the bottom of the roof deck.

The fiber tower is served by an Innovent roof mounted constant volume desiccant dehumidification unit equipped with mechanical DX precooling and post cooling coils and natural gas fired heat. The unit (via an onboard controller) operates all functions to satisfy the desired space conditions. The desired space conditions are reported to be 70° dry bulb and a maximum permitted space relative humidity of 30% with the space in a positive pressure relative to surrounding spaces and to outdoors. No requirement for space humidification during winter months was reported.

The work performed under this assignment is the initial investigative work. Space temperature and humidity data loggers were installed in the space during this assignment and they will be retrieved in the coming weeks when they time out.

Reported problem(s)

1. During the summer months and shoulder seasons, the relative humidity in the fiber tower rises above the permitted limit of 30%. No specific outdoor conditions were provided.
2. The fiber tower is in a negative pressure relative to surrounding spaces and to outdoors.
3. Operating outside of the specified limits and with the space in a negative affects the product.

Assignment

1.Determine the reason or reasons for the fiber tower exceeding the maximum relative humidity limit.
2.Determine the reason(s) for the fiber tower operating in a negative pressure.
3.Provide recommendations for corrective actions.

Observations and technical notes

Innovent unit (main unit supplying the fiber tower)
1.The unit was found upon arrival to be set (in the unit controller) to 72°F and 35% RH.This condition is in excess of the conditions noted to us.
2.A balance report was not available for the fiber tower and lathe room. Air flow readings were not taken during this assignment.

Read More...link to pdf of full project report

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STEAM CONDENSATE MANAGEMENT

Water hammer is a troublesome but commonly-occurring issue that can plague a steam system. The most obvious symptom is the hammer-like noise it creates, but, when left unchecked, water hammer can cause serious damage to vents, traps, regulators, and piping. There are two types of water hammer. The most common type is usually due to an accumulation of condensate trapped in a portion of horizontal piping. Steam picks up the resulting water "slug" and hurls it into the nearest pipe fitting at high velocity. The second type is caused by a steam bubble forming or being pushed into a wet return line or pump discharge piping. When the bubble cools, it implodes with great force. Other main causes are improperly dripped mains and faulty steam traps.

The causes of water hammer are often difficult to identify, so it is oftentimes tolerated, considered to be more of a nuisance than a problem. But when left unchecked, water hammer can result in costly repairs.

An experienced steam professional can identify the causes of water hammer and resolve the issue. Contact MSC at 973-884-5000 if you are experiencing water hammer, or if you have any questions.

Motor Failure Prevention

Motor failure, which usually occurs at startup, always seems to happen at the most inopportune time. To prevent motor failure, ensure that voltage is neither too low nor too high, and that the motor is running within acceptable amperage according to the nameplate rating. Check for vibration, especially on larger motors of 20 hp and up. When motor failure does occur, it is imperative to determine exactly what caused it to fail. If the underlying issue is not corrected, the replacement motor is likely to fail as well.

Six common causes of motor failure are 1) over-current, 2) low resistance, 3) overheating, 4) dirt, 5) moisture, 6) vibration. Photo: a 75 hp motor's stator winding that failed due to overheating.

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.