mechanicalservicecorporation

TECH TALK

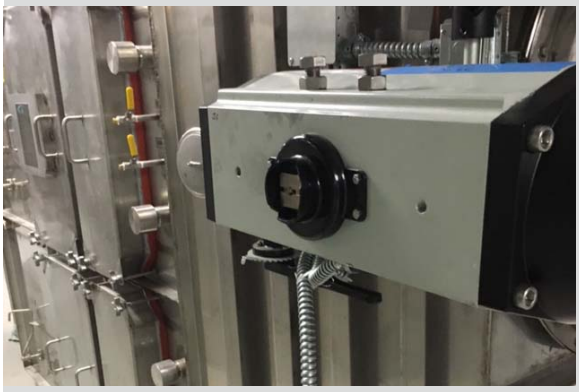
MSC - THE ONLY TRUE HVAC SERVICE COMPANY - WE FIX IT

NEWSLETTER - JULY 2017

973-884-5000

SERVICE CALLS

A new customer called MSC with HVAC problems in an MDF room housing critical servers & switches that operated the building's teledata systems. The secondary back-up cooling system, which consisted of two DX split systems, was not operating. MSC quickly discovered programming issues on LCD thermostats. As it turned out, the system had never been tested or set up properly, and a simple temperature adjustment brought the backup cooling system back online.



MSC responded to a service call for an HVAC system that wouldn't restart. Cooling was down and immediate help was needed. MSC quickly traced the problem to one of two dozen dampers. The damper had reopened properly but the limit switch was not closing the circuit. With minor mechanical linkage adjustments, the technician was able to adjust the linkage to get the limit switch to close when the damper was fully open. The control damper was retested and cooling restored.

Recognizing and Repairing Fan Stall

When a fan is selected for a given application, the expectation is for steady air flow and pressure with little fluctuation. Certain conditions, however, can produce extreme variations in air flow, leading to a variety of issues that include excessive noise, structural metal fatigue, and a reduction in efficiency. One such condition is called fan stall.

Air is deflected when a fan blade passes through an airstream. If the attack angle of the blade is increased, the amount of air deflection is likewise increased, generating higher air pressure. But if the attack angle becomes too severe in relation to CFM, air will no longer flow uniformly and will separate from the blade's surface. Centrifugal force causes the air to move outward toward the tip of the blade, rather than continuing forward, resulting in a drop-off in pressure. This is what is known as the stall point. Fans operating in stall are extremely noisy, at times emitting a loud hammering sound, and are highly prone to sustaining mechanical damage.

Stall usually results when CFM is too low – in other words, the selected fan is too large for the system. This is a mistake often made by underqualified or inexperienced designers who specify a larger fan than needed to compensate for possible calculation errors. Not only does this increase stall risk, it wastes energy. Experienced HVAC designers and contractors are better equipped to make appropriate fan selections and can take additional steps to avoid stall.

INSIDE...

A temporary fix that can often eliminate stall is to increase air flow through the fan by creating a "leak" downstream or by running a duct from the outlet back to the inlet. This, however, will reduce system efficiency. If fan stall is a persistent problem, replacing the fan with a properly-sized unit is probably in order.

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Coil and In-Duct UV-C Systems Improve IAQ

Application of ultraviolet, or UV-C, light is emerging as a highly effective method of eliminating microbial growth in air handlers to lower building energy costs, improve IAQ, and reduce maintenance. Also known as ultraviolet germicidal irradiation (UVGI), UV-C targets microorganism DNA, causing cell death or rendering microbes unable to reproduce. It has long been used as a germicide in applications including equipment sterilization and water purification and is increasingly being in HVAC systems.

Damp, humid conditions encourage accumulation of organic materials and biofilm growth on evaporator coils, air filters, duct surfaces, and drain pans. Left unattended, these materials can choke airflow, decreasing HVAC system efficiency and releasing contaminants and odors into the airstream. Studies have shown that installation of UV-C purification systems can restore system capacity by as much as 35-40% and drastically reduce energy consumption.

There are two basic types of UV-C systems, coil and in-duct, which are often used in tandem. Coil treatment systems are more effective, as exposure is continual. ASHRAE recognizes the benefits of UV-C and has published recommendations for microwatts required to obtain these benefits. Payback on UV-C systems can occur in as little as six months, and further savings are realized through reductions in maintenance. Installation is inexpensive, costing about the same as a single professional coil cleaning.

SUBMETERING PROBLEM SOLVED

A large hospital construction project in northern New Jersey was nearing completion, but electrical submeters installed throughout the facility were still not operational despite several unsuccessful attempts to get them working. With various departments and services slated to move in, time was of the essence, and MSC was recommended to come in and solve the problem.

Of the approximately twenty submeters in question, some were single meters installed on the main substation breakers, and others were installed on specific air handlers and other critical electrical loads. Various meters were providing low or slightly-negative values, or no values at all. The root of the problem, MSC found, was that the meters communicated via Modbus protocol, and the building automation system used BACnet.

MSC technicians first confirmed that proper gateways were in place to convert Modbus to BACnet, then checked to see that the submeters were installed correctly. The LCD meters were individually programmed, and upon testing a few were found to have their bridge wiring reversed.After correcting the wiring issues, technicians programmed the gateways and brought the Modbus meter readings online one at a time, then programmed the BACnet side to establish communication to the BAS front end. Working closely with the project team, MSC verified that all meter values were correct and reading in the right locations and properly commissioned. All submeters were up and running on schedule, enabling the hospital to monitor electrical consumption of various departments throughout the facility.

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WARRANTY SHMARRANTY By Pete McGrath

A decline in equipment quality and manufacturer integrity is pervading the HVAC industry

Integrity oftentimes comes in the form of a handshake. Twenty years ago, that handshake meant something to HVAC equipment and compressor manufacturers who provided and honored bulletproof warranties for their products. Lately, though, it seems that many of these manufacturers are hiding from their duty to do the right thing for their customers when something goes wrong. To be clear, this doesn't apply to all manufacturers, but it is a growing problem that all building owners and facility managers should be aware of.

A promise is made when a manufacturer sells their product, one that states "if it breaks during the warranty period, we'll honor our agreement and give you a new one", but there has been a marked deterioration in the "honor" part of the warranty over the past few years. As more and more manufacturers crank out increasingly chintzy parts and equipment, failure rates are on the increase. Instead of standing behind their products, many manufacturers make excuse after excuse why they can't or won't replace the broken part or unit. Just recently, an MSC client found themselves in a dispute with an indoor pool HVAC manufacturer that, despite an explicit five-year warranty on their chemical-resistant coated evaporator coil, informed our client that severe deterioration of their 1 ½ year-old coil was "not our problem".

MSC has also seen a major uptick in new screw compressor failures, some of them "bad out of the box", accompanied by stonewalling by the manufacturers against honoring terms of their warranties. Last month, we found ourselves engaged in two simultaneous warranty disputes with two different compressor manufacturers on issues that should have been cut and dried. For some manufacturers, it seems, integrity has taken the last train to Clarksville and shows no sign of coming back.

Despite this troubling trend, there are some proactive steps that owners and contractors can take to protect themselves from warranty issues. First and foremost, it is important to have a good PM program in place to head off future warranty disputes, as documentation of regular maintenance can effectively thwart manufacturers who try to blame customers for premature parts or equipment failure. On projects with all new equipment, it is advisable to hold retainage until equipment has been commissioned and proved fully functional in case a manufacturer balks at honoring a warranty when something goes wrong. When purchasing new equipment, seek the guidance of an experienced contractor like MSC who can advise which manufacturers produce high-quality equipment and are likely to honor their warranties and which ones to steer away from.