

## SERVICE CALLS

**Variable Frequency Drive** hand mode a temporary solution - When building occupants complained about lack of cooling, a client erroneously switched this VFD from automatic to hand mode and dialed it up to operate continually at max speed, defeating the VFD's purpose. MSC provided a permanent solution with a quality air balance and a calibrated static pressure transmitter for better control.



**Condensate** carry-over occurs when condensation is blown from a cooling coil into the supply duct, rather than trickling down into a drain pan. This condition usually occurs when air velocities are greater than 600 fpm. The water accumulates in the ductwork and eventually starts leaking and dripping. Condensate carry-over can be prevented with proper air balancing.



## R-22 Phase-Out: Replacement & Retrofit Considerations

**Refrigerant is the principal agent that helps transfer heat and makes air conditioning, dehumidification, and refrigeration possible.** With the ongoing Montreal Protocol HCFC phase-out now in its final stage, many consumers have to make important decisions regarding their HVAC equipment.

As of January 1, 2015, allocations of ozone-depleting HCFCs, including the widely-used R-22, have been significantly reduced and will decrease annually until 2020, when reduction in consumption and production is expected to reach 99.5%. *After 2020, servicing of R-22 systems must rely on recycled or reclaimed refrigerants.* This has resulted in skyrocketing prices and increasing scarcity of product. There are many HFC and HFC-blend refrigerants available today that do not deplete the ozone, and R-22 users should explore equipment replacement or system retrofit options. Replacing R-22 HVAC systems with new energy-efficient equipment can be expensive, but tax rebates are available to defray costs.

**As for R-22 retrofits**, many good alternatives such as R-407C, R-407A, R-427A and R-438A are available, but finding the best option can be challenging. There are many numerous considerations that must be taken into account - equipment application, design capacity, oil type, changeover costs, etc. - when considering retrofit, and there are no simple, drop-in replacements or easy answers. Some of the most versatile refrigerant retrofits only require replacement of critical seals on certain systems, but performance issues following retrofit are not uncommon.

MSC is a specialized expert in HVAC and can help clients who are considering R-22 equipment retrofit or replacement find options to fit their specific needs and budget. Contact us at 973-884-5000 for more information.

## INSIDE...

- R-22 Phase Out / Service Calls: VFDs & Condensation
- Cooling Challenges / Tech Tidbit: Reduce Energy Bills
- Optimizing Chiller Efficiency
- Wireless Steam Control Valves / Did You Know

# TECH TALK

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## Cooling Challenges: Let Your Environment Do the Talking

Now that hot, humid weather is upon us, MSC is busy addressing issues that tend to become apparent during summer months. Building heat sources, which can assist heating systems and make occupants feel comfortable during winter months, contribute excessive heat that must be overcome when temperatures rise. As it is often said in the HVAC industry, heating is quite forgiving, but cooling is not.

There are numerous heat sources that can tax a cooling system. Besides outdoor heat and humidity infiltration, sunlight through windows and skylights, things like office equipment, appliances, electronics, and human bodies can all contribute to heat loads that put your system to the test if it is not up to par. Stratification, which can cause large temperature and humidity differentials within a building, can occur. Systems may

run continuously and can't maintain a desired set point, resulting in skyrocketing electric bills. These problems can be the result of improper sizing, lack of maintenance, or a plethora other system issues.

*It is important to take note of cooling problems and inconsistencies and consult with an HVAC service expert like MSC. Our objective is to make clients' existing cooling equipment run at its optimum potential and efficiency, not to replace it, and many cooling issues can be resolved easily and inexpensively. Contact MSC at 973-884-5000.*



## TECH TIDBIT...

○ According to Consumer Reports, homeowners can reduce their annual energy bills by about \$400 by plugging air leaks around windows, doors, and electrical outlets, and by insulating and sealing ductwork. Wi-Fi programmable thermostats that lower temperatures while you're away or asleep can deliver 10 percent savings. If you have an old electric water heater, replacing it with a hybrid water heater, which combines a standard electric water heater with a heat pump to capture warmth from the air, could lower bills by \$350 a year. Replacing old appliances like refrigerators and top-loading washing machines, can save several hundred dollars annually.

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## Optimizing Chiller Efficiency with Control Advancements

Finding ways to save energy is an important pursuit in any business, and most don't have to look any further than their chiller for the biggest electrical hog. Chillers can draw 35-50% of a building's annual electrical use, and finding specific ways to optimize performance is an important step in reducing energy costs.

Chiller technology is constantly improving, and whether you're considering replacing your chiller or optimizing your current operation, there are many excellent options available. Of course, the largest improvement can be achieved with a new, high efficiency chiller. Older chillers, even with excellent PM, water treatment, and tube cleaning, can decline to 0.80-1.0 kw/ton peak efficiency after fifteen or twenty years. **New-generation chillers can achieve 0.50 kw/ton or higher and can reduce energy needs by 30-55%.**

For existing equipment, recent developments in chiller plant management and maintenance software can significantly reduce energy costs. These programs provide continuous monitoring of operations and a plethora of information that enables users to identify performance and calibration issues. This is especially helpful in multi-chiller plants, where software can trace issues to specific chillers and make the necessary corrections to run to the current load.



## Science: Wireless Steam Control Valves

The first law of thermodynamics states that energy cannot be created or destroyed; it can only be changed from one form to another. Total energy in an isolated system is constant, neither increasing nor decreasing without interference from outside.



Now available on the market is a wireless steam control valve (photo by Forbes Marshall) that gets its power for the valve actuator from a thermopile arrangement strapped to the hot steam pipe, making it completely self-sufficient. The Seebeck Effect, in which two dissimilar metals will produce a voltage when there is a temperature difference between the metals, is responsible for the behavior of the thermocouples in the thermopile.

### DID YOU KNOW...

- Installing a geothermal heat pump in your home can be pricey, but the DOE estimates a swift payback period of 5-10 years. A 30 percent federal tax credit is available through 2016.