

## HVAC SYSTEMS

### Pollen & Humidity Challenge..

Recent rains have finally washed away most of the greenish-yellow haze of pollen that filled the air, coated cars, and made allergy sufferers sneeze and snuffle. But, unbeknownst to many, plenty of pollen is still lurking, unseen, and wreaking havoc on HVAC systems.

When high levels of pollen combine with rising humidity, these particulates accumulate quickly in HVAC systems. Filters become caked with pollen and dust, creating an increased pressure drop across the filter, and lowering the airflow and efficiency of your system. Before the real dog days of summer are upon us, you want to make sure your HVAC system is at its peak performance, so those who haven't already changed their HVAC filters should do so as soon as possible. And since pollen can also get into ductwork, it's wise to have ducts downstream from filters inspected for pollen and dust that made it past the overtaxed filters.



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## PREVENTING REPEAT COMPRESSOR FAILURE Pt. 1:

**By: Harry Hartigan for CONTRACTING BUSINESS MAGAZINE**

The last thing your customers need is their mechanical system failing because of repeat compressor failures. There are many factors that can cause a compressor to fail and, as a service contractor, no amount of technology or skill with tools can beat good detective work in the field. Let's examine four areas of concern:

- ▷ Superheat
- ▷ Capacity Control
- ▷ Compressor Condemning Process
- ▷ New Compressor Start-up.

### Superheat

Suction superheat (or lack thereof) significantly impacts compressor life. An improper superheat setting and poor refrigerant control will cause a slow death from repeated starts with poor lubrication. In extreme cases, poor superheat control is the setup for a catastrophic internal failure caused by oil slugging.

No matter how you look at it, control over suction superheat at all times is critical. The recommended superheat setting for air conditioning duty (assuming the system has a thermostatic expansion valve (TXV), and operates in the range of 90 to 125F saturated condensing temperature and 30 to 45F saturated suction temperature), is a minimum of 15F and a preferred 20F (after deducting the expected error as illustrated in the chart below from Brainerd Compressor). Maintain this setting at all times (loaded and unloaded) to ensure that only dry gas returns to the compressor.

### **Consideration should be given to the following:**

- ▷ Application of a given TXV (or multiple TXVs over the capacity range of the refrigeration circuit) must be checked over the full range of expected operation to ensure control.
- ▷ TXVs should be selected using the manufacturers' extended capacity tables. The selection must then be checked over the entire expected operating range. TXV selection should never be made by the counter person at the supply house based on the nominal rating of the valve (typically stamped on the box). Selection in this manner typically leads to an oversized TXV even at full load, which significantly affects control at part load.
- ▷ Variables that will affect how a given TXV performs include: *continued on pg. 2*



## PREVENTING REPEAT COMPRESSOR FAILURES Pt. 1:

**By: Harry Hartigan** - *continued from pg. 1*

**Outdoor ambient temperature** (which affects the condensing temperature and subsequently, the inlet pressure to the valve).

**The degree of refrigerant sub-cooling entering the TXV** (more sub-cooling requires fewer pounds of refrigerant to be circulated to obtain a given refrigeration effect).

**Evaporator temperature**, also known as saturated suction temperature.

**Compressor(s) unloading capability** (could be a single compressor with significant unloading capability or a circuit with multiple compressors).

Don't assume that a TXV will control superheat below about 70% capacity for single ported valves and about 50% for balanced ported valves.

Although some manufacturers advertise that balanced ported valves will control down to 20% of their maximum capacity, they'll likely not do so reliably for extended periods of time.

Also, if a single TXV is likely not to control over the entire range, consider using multiple TXVs with individual solenoid valves. As the load drops, close the solenoid valve serving the larger TXV, and open the solenoid valve serving the smaller TXV.



This has the affect of keeping the valves operating in the normal, expected controllable range.

**To continue reading the Part 1 & Part 2 articles click below:**

Part 1: [http://contractingbusiness.com/residential/cb\\_imp\\_5549/](http://contractingbusiness.com/residential/cb_imp_5549/)

Part 2: [http://contractingbusiness.com/residential/cb\\_imp\\_5591/](http://contractingbusiness.com/residential/cb_imp_5591/)

## RETRO-COMMISSIONING

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*As the True HVAC Service Company, we welcome your questions on how retro-commissioning can directly benefit you. Please contact Mr. Steve Meigh at 973-884-5000, ext. 116, for assistance for our retro-commissioning process.*