

Photo Gallery



Common Causes of COMPRESSOR FAILURE

Oftentimes when a compressor fails, a common solution is to simply replace the failed compressor without determining why the compressor failed. If the cause of the failure is not established and corrected, it is highly likely that the replacement will fail as well.

There are 5 main reasons for compressor failure:

Refrigerant flood back occurs during the running cycle when large volumes of liquid refrigerant are returned to the running compressor down through the suction pipe work in an uncontrolled manner. There are numerous causes of flood back including low evaporator loads, oversized equipment, poor cold room circulation, faulty evaporator fans, oil logging in evaporator, poor evaporator defrosting or defrost schedules, and oversized expansion valve orifice.

Flooded starts happen when refrigerant migrates from the system and condenses into the compressor oil. It is typically caused by system overcharge, crankcase temperature lower than evaporator, long "off" cycle times, compressor located in a cold, windy environment, faulty crankcase heater, one-time pump down control (rather than continuous), or leaky solenoid valve.

Liquid slugging results when large quantities of refrigerant enter the compressor and mix with the lubricating oil in the sump. It can cause damage to suction and/or discharge valve reeds, springs, and valve assembly, piston crowns, scored cylinder bores pistons, and rings, broken con rods, and broken crankshaft. Liquid slugging can usually be prevented by correcting refrigerant flood back and flooded starts.

Overheating has numerous causes, including too-high compression ratios, too-low suction pressure, too-high discharge pressure, and too-high suction superheat, to name a few. To prevent compressor overheating, adjust settings to design specs, rectify condenser issues, adjust suction superheat, and check all system pressures and temperatures.

Lack of lubrication occurs when oil is a) degraded due to overheating or contaminated by liquid migration, b) blocked from reaching the bearings, or c) loss of oil in the system. Oil loss can be caused by control stat short-cycling, oil traps within the piping, loss of gas charge, poor pipe work design, excess oil in the system, or insufficient oil charge in the system due to long pipe runs.

People often wait to seek the help of a professional until after they have incurred the unnecessary expense of having to replace several compressors. Fortunately, this scenario can be avoided by having an experienced professional diagnose and correct the root cause of a compressor failure the first time it occurs.

Understanding MERV Filter Ratings

MERV Rating (Minimum Efficiency Reporting Value) is a standard used to measure the overall efficiency of an air filter. Higher MERV ratings are assigned to filters capturing the greatest percentage of airborne particles and contaminants. Filters with MERV ratings of 1 to 16 are capable of filtering particles ranging from 0.3 to 10 microns. Higher MERV ratings of 17-20 are assigned to HEPA and ULPA filters capable of trapping particles smaller than 0.3 microns.

MERV 1-4 - Lower-quality residential filters with minimal filtering ability.

MERV 5-8 - A better choice for homeowners, commonly used in commercial settings. Can stop particles as small as 3 microns (mold spores, dust mite debris, pet dander).

MERV 9-12 - Capable of filtering particles of 1 to 3 microns such as Legionella, humidifier dust, lead dust. Usually used in commercial and industrial applications.

MERV 13-16 - Effective for hospital and surgery settings. A MERV 16 filter captures more than 95% of particles spanning the full test range including bacteria and tobacco smoke.

MERV 17-20 - Used in pharmaceutical and electronics manufacturing and in clean rooms, these filters are capable of filtering viruses, radon, carbon dust. Impractical for typical HVAC systems.



Preparing for the Heating Season

Swing season is here. The long, hot, humid summer is behind us, and we are enjoying the fair days and cool nights of fall. As we transition from cooling to heating, now is the time to make sure your economizer cycles are working properly to take advantage of the free cool nighttime air.

Fall is also the time to perform preventive maintenance on all of your systems. Remember, good PM goes well beyond changing filters and belts. We recommend inspecting heat exchangers, balancing hydronic systems, checking heat pump systems, and checking heating controls.

Retro-commissioning, or RCx, is always highly recommended. The retro-commissioning process examines a facility as a whole to see how systems function interactively. Systems are inspected, monitored and tested. Repairs, changes and improvements are made along the way, and results are verified. Air and water balancing is recommended to most customers. The benefits of RCx are substantial. Once a building is performing in the way it was intended, equipment life is extended, down time is reduced, and an average energy savings of 10-15% can be expected.

“Allow MSC to review your Preventive Maintenance procedures” Please call Steve Meigh at (973) 884-5000.



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