Low Superheat
**Low Superheat**

- Low superheat indicates an excess of liquid refrigerant in the evaporator coil for the heat load present.
- This means either too much refrigerant is entering the coil or there is insufficient heat present to properly vaporize the refrigerant.
- In these cases it is likely that liquid refrigerant is present in the suction line and may possibly enter the compressor causing compressor failure.
Some possible causes of low superheat are:

- Refrigerant Overcharge
- Metering Device Over-feeding
- Low Evaporator Air Flow*
- Oversized Equipment
- Low Condenser Air Flow

*Number One HVAC Service Call
Refrigerant Overcharge

- An overcharge of refrigerant can force excess refrigerant into the evaporator due to the higher pressure differential across the metering device.
- The excess refrigerant does not absorb enough heat in the evaporator to completely vaporize, lowering the superheat.
- If the refrigerant does not absorb enough heat in the suction line to vaporize, liquid refrigerant will enter the compressor causing compressor damage.
Metering Device Overfeeding

- A metering device that is allowing too much refrigerant to enter the evaporator will cause a flooded coil similar to an overcharge.
- If the sensing bulb of a TEV is not insulated or properly secured to the suction line, the valve will overfeed.
- Incorrect or missing piston will also overfeed.
- When the device overfeeds suction pressure increases and discharge pressure increases.
Low Evaporator Air Flow

- Low evaporator air flow is the single most common cause of low superheat.
- Low air volume reduces the amount of warm air available to vaporize the refrigerant in the coil.
- This may prevent all of the liquid refrigerant from vaporizing causing the lower superheat.
- The liquid refrigerant may then enter the suction line and possibly enter the compressor as a liquid causing compressor damage.
- Both suction and discharge pressures will be lower than normal.
- Dirty filters and coils, bad motors, closed registers and improperly sized duct systems can all reduce evaporator air volume.
Oversized Equipment

- When a system is greatly oversized for its load there is not enough heat available to completely vaporize the liquid refrigerant in the evaporator.
- The oversized unit will most likely short cycle.
- Indoor relative humidity will likely be higher than normal with the oversized unit.
Low Condenser Air flow

- Low condenser airflow increases condensing temperature thus increasing the pressure in the condenser coil.
- This delivers the refrigerant to the metering device at a higher initial pressure.
- The increased pressure drop across the metering device allows more refrigerant to flow.
- The result is lower superheat, high suction pressure, high discharge pressure and lower sub-cooling.
- The most common cause of low condenser air flow is a dirty coil.
- This condition could also be caused by bad motor bearings, defective capacitor, and shrubs or other obstructions around the unit.