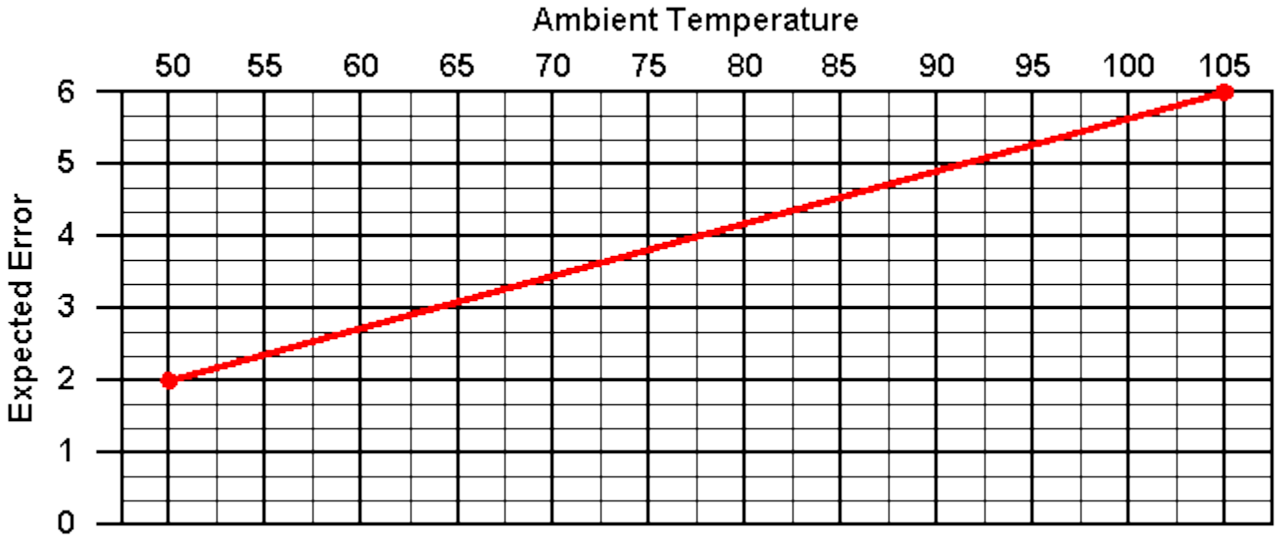
Superheat Recommendations

Recommended superheat setting for air conditioning duty, (TXV, 90 to 125° SCT), is a minimum of 15° and a preferred 20°, taken at the compressor, within 12 inches of the suction service valve, and after you deduct the expected error. This setting should be maintained at all times to prevent compressor flooding. Compressors that run unloaded for extended periods may be operating outside the capabilities of the expansion valve. Do not expect a TXV to properly control the superheat if it's operating at 50% of its rated capacity.

Recommended method of taking superheat; Strap a good electronic temperature probe to a clean suction line within twelve inches of the suction service valve. Replace the Armaflex and add two layers of one-inch fiberglass insulation (or equivalent) over the Armaflex, extending six inches in both directions from the temperature probe. Take suction pressure, line temperature, and ambient temperature.

Do not play around with super-heat unless all the normal system settings have been checked and found OK.

SUPERHEAT = Line temperature minus suction pressure, converted to temperature, minus error (see graph)



CAPACITY CONTROL

Compressors that run with a low suction pressure or unloaded for extended periods of time when the conditioned air space requires cooling and the temperatures indicate the evaporator load should be high could be a result of a system fault. Faults such as dirty filters, a system restriction such as restricted driers, bad TXV or liquid line solenoid valve, dirty or defective evaporator or chiller, poor air or water flow or a system sized much larger than the load.

Compressors are not designed to run unloaded for extended periods. The more capacity control a compressor has, and the more it runs unloaded, the hotter it runs. This may shorten the compressors life. Compressors also pump a small amount of oil out of the compressor while running which must be returned to the compressor at the same rate of loss to maintain compressor lubrication. Any reduction in compressor pumping capacity also results in a gas velocity and volume reduction. These are used for both oil return and compressor cooling. It may also result in a loss of superheat control followed then by flooding, oil dilution, and/or bearing failure. The majority of compressors that fail with one or more of these conditions show the general cause of failure to be "Loss of Lubrication". Any system fault will eventually show up in the compressor. All system faults such as design, installation, or defective components must be corrected before the compressor is left running, if it's expected to last.

No capacity controls are factory preset. Because of the variation in HVACR system temperature and Freon applications, all compressors that have internal suction capacity control such as 5F, 5H, 06G, 06LH Carrier and Trane A, B, E, and F must be field adjusted to the desired evaporator pressure. Any removable capacity control device that is removed from a defective compressor and installed on the replacement should be checked for proper orientation and operation or replaced if found to be defective. The control for systems using electric solenoids should also be checked. Additional information on installation, operation and setting of capacity controls can be found in the Brainerd Manual.

OIL PRESSURE

The following are expected oil pressures and oil failure switch recommendations for some compressor makes and models. Oil pressures listed are net oil pressure (oil pump pressure minus suction pressure).

Never reset the oil pressure switch more than once without finding out the cause of trip

The terms "cut in" and "cut out" refer to the warp switch within the oil failure switch.

Carrier/Carlyle older 06D & 06E compressors should have a net oil pressure of 12 to 20 psig. Newer 06D & 06CC, 16 to 37 CFM, should have 18 to 26 psig, 06E & 06CC compressors, 50 to 99 CFM have 18 to 34 psig. Oil failure switches should have 11 psig cut out, 4 psig cut in with a 45 second delay, and 120 seconds with POE oils. 5F, 5H and 06G, 06LH compressors typically have 40 to 60 psig net oil pressure. We recommend 25 to 30 psig trip with a 45 second delay. This is minimum needed for proper operation of the capacity control systems on 5F40 thru 5H126 and all 6G/06G and 6L/06LH compressors.

Chrysler's recommendations on oil failure protection calls for an oil pressure safety control settings to cut out at 30 psig and cut in at 25 psig with a 45 second delay. This is minimum for lubrication and proper operation of the capacity control system. Normal oil pressure should be 40 to 60 psig net.

Copeland compressors should have 20 to 40 psig net oil pressure. Oil failure switches should have a cut out of 14 psig, cut in of 9 psig, with a 120 second delay.

Dunham-Bush D/B metic compressors should have 20 psig net oil pressure, all Big-4 compressors should have 30 to 50 psig net.

Trane 'M' & 'R' models should have 30 ± 5 psig net oil pressure, minimum 20 psig. Trane 'E' & 'F' models, open and hermetic, 50 to 60 psig net. These compressors typically have higher than 60 psig. Originally 'E' model cut in was 17 psig but in 1970 this was changed to 30 psig cut in and the oil sensing port was moved from just under the oil pump to a port on the unloader hand hole cover on all 'E' open and hermetic compressors.

York 'J' compressors, styles 'A' thru 'D' should have a net oil pressure of 25 to 40 psig. Styles 'E' and later should have a minimum of 60 psig net.

The warranty covers defective material and/or workmanship and does not cover failure due to system defects