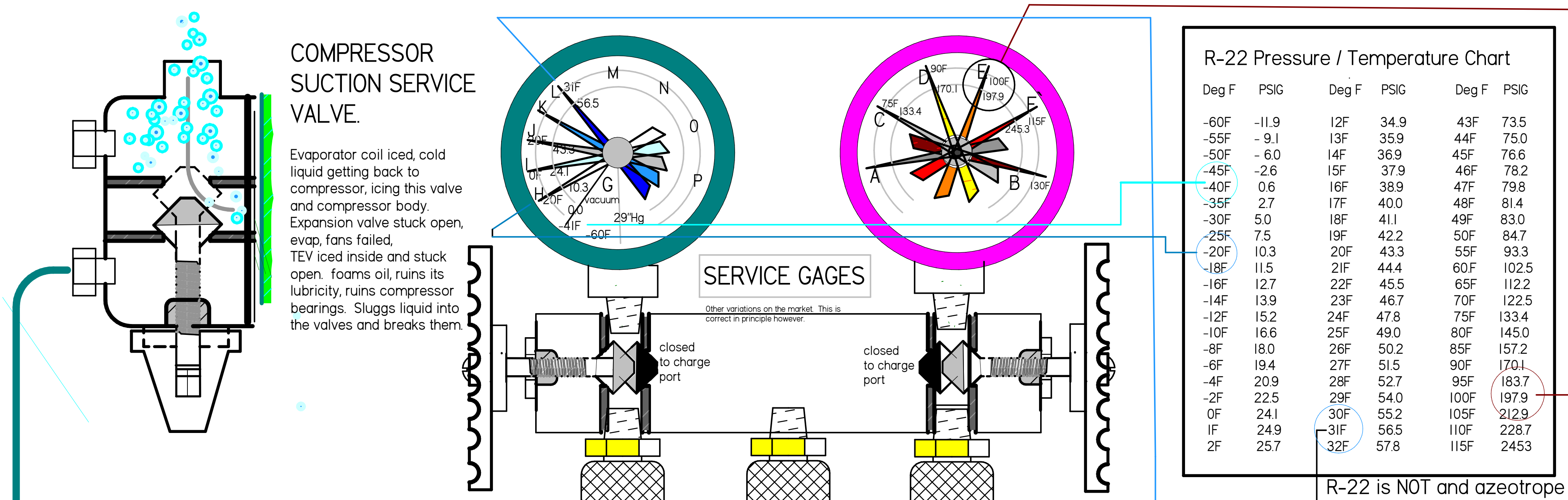


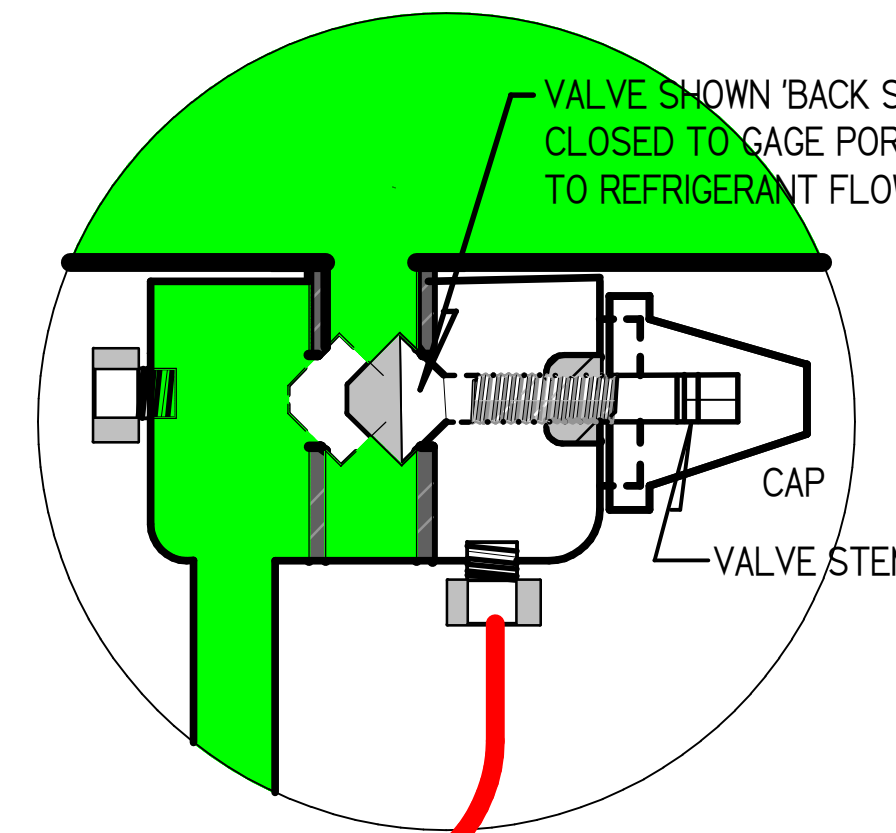
REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED



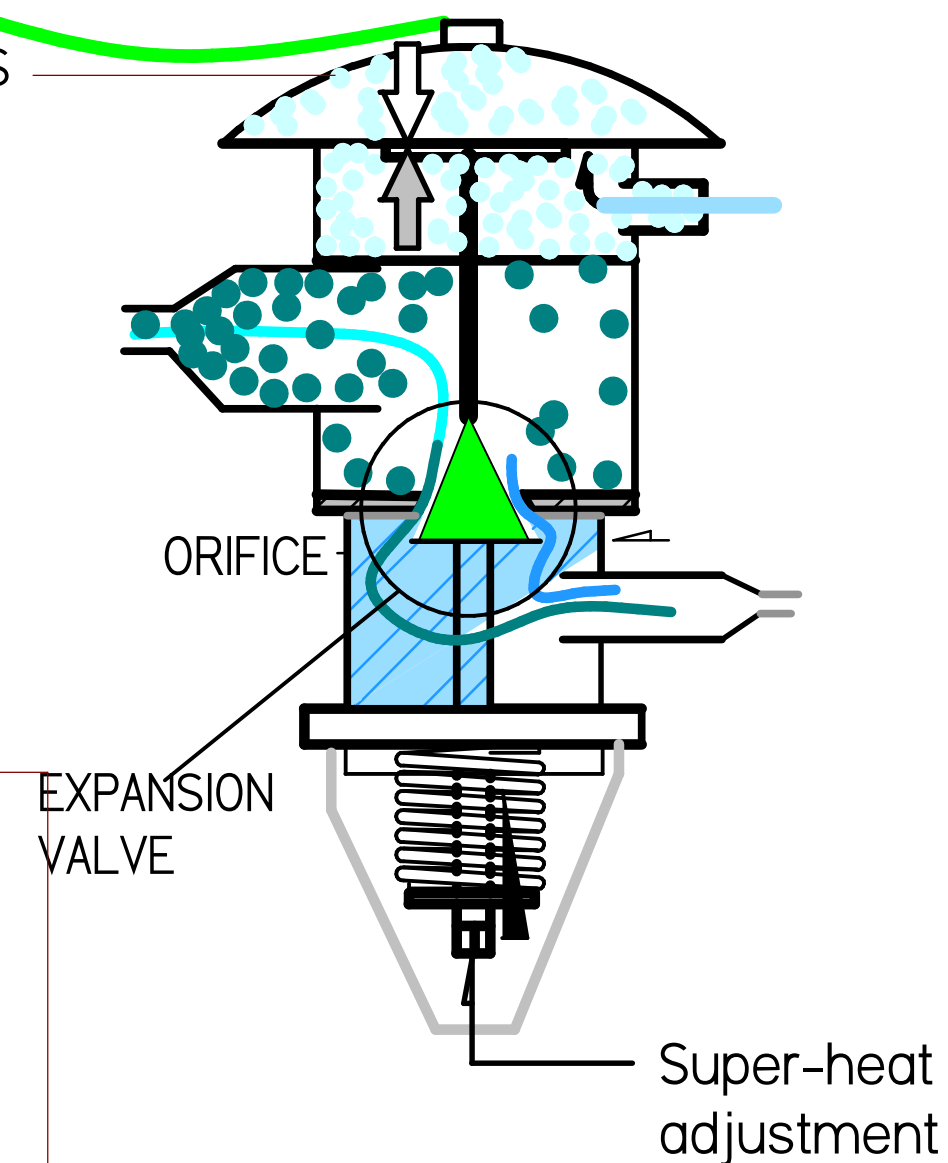
**GAGE READING LEGEND, VARIOUS SYSTEM CONDITIONS, TYPICAL ONLY.**

- A. With compressor OFF, system is almost out of refrigerant.
- B. With compressor ON, its 110+F outside or condenser is dirty. etc.
- C. System out of gas, or restricted refr. flow, or below 50F outside
- D. Normal for outside temps in the 80F range.
- E. Normal for 85-90F day.
- F. Normal for a hot day 100-105F.
- G. Vacuum range, don't run a system below 0 psig.
- H. Typical frozen storage range if system is working OK.
- I - J. Ice machine range, 35F box with coil undersized.
- K. AC range if its low on gas or filter is dirty, , high for a 35F box.
- L. Air conditioning range if its working right.
- M, N, O. P. High suction pressure, very warm air over evap coils or bad valves in the compressor, typically.
- Q..... Hysterisis, is the 'stlop' between pressure and temperature switch cut-in and cut-out settings with any control system. setting these too close together can cause overlaps and control problems. especially with pressure switches. In that case use of temperature controllers to operate liquid line solenoid valves, allows the pressure settings on pressure controllers to be set quite wide and eliminates many of those problems,
- R. Low suction pressure with full liquid line sight glass indicates a clogged filter or closed expansion valve. Head pressure does not build as one might expect, because the refrigerant SUPPLY is blocked, and the hot gas in the condenser cools, and its pressure DROPS. So you have low head pressure AND low Suction pressure with a blockage in the liquid line filters or Devices

World class coaching, FAST & Affordable is available on this and any other diagram or system on this web site. Half an hour usually does the trick. See our TRAINING page.



IF RUSTY, LEAK RELEASES PRESSURE, VALVE CLOSES.



R 410a and many others are. At certain Temperatures these separate into their two component gasses. HFC 32 and HFC125 In the case of leaks, only ONE of the components can leak, changing the composition and behavior of the refrigerant and will cause serious performance problems. Detectable by comparing the temperature/ Pressure chart readings for the complete azeotrope, to what it is reading for any given temperature on a pressure gage. Not a major problem with R410a but it can be if vapor charged, Its worse with other refrigerants such as R502 replacements.

I will produce part of the R-410a chart here with notes on those reads.

The entire charge must be removed and replaced if there is a discrepancy in the saturated pressure of the refrigerant from specifications.

R-22 reads 57.5 psig at 32F  
R-410 reads 101.6 psig at 32F

If you were to shut an iced evaporator coil down, with refrigerant in it, with R410a in the system it should read 101.5 psig. If it reads significantly higher, it has lost some of one of its component gases. ( be sure to verify your gages are accurate.. ). This would ruin the efficiency of the system and drive operating costs up dramatically.

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**REFRIGERATION, TROUBLE SHOOTING #3 IN A SERIES**

- Bad Compressor
- Azeotropic Refrigerants.
- Air in the system
- Acid formation
- Non compatible oils / refrigerants
- Control Hysterisis
- various failure modes.

When a system is converted from R-22 to R-410a, all of then MINERAL oil must be purged from the R-22 system, . it is NOT compatible with the SYNTHETIC (ester) oil required by R-410a. ven a slight mix can congeal and cause all sorts of problems.

R-22 components are not rated for the much higher pressures of R-410a

R410a picks up oxides that R-22 left behind and realeses them to clogg filters and small orifices.

R410a breaks down to the exceptionally damaging HF ( Hydrogen Floride gas ) at soldering temperatures and is much more dangerous in that aspect then R-22. HF dissolves soft tissue (including lung tissue).

Refrigeration Trouble shooting 3 of 20 ref. series