

Pressure-Based PT Charts

Technical Bulletin

Product: R-448A, R-407F, R-450A, R-422D

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Application: HVAC and Refrigeration

Background: Blended refrigerants exhibit glide due to the different properties of the blended refrigerant components. Glide is communicated to the service technician using a Pressure-Temperature (PT) chart. A traditional PT chart includes the refrigerant **temperature** in the left column, and the different pressures associated with that temperature in the subsequent columns. For Example:

In Table 1 for a coil at 45 psig:

- ① Average coil temp is 15°F
- ② Bubble temp is 10°F
- ③ Dewpoint temp is 20°F

This method of showing the same temperature for different pressures leads to confusion and can result in misunderstanding of glide. This is because the boiling or condensing process is a constant **pressure** process, not a constant **temperature** process.

Resolution: Using a PT chart with **pressure** in the left column allows a technician to intuitively see what is happening in the evaporator.

In Table 2 for a coil at 45 psig:

- ① Average coil temp is 15°F
- ② Bubble temp is 10°F
- ③ Dewpoint temp is 20°F

The pressure-based PT chart results in the same values but is much easier to use. It more clearly shows that the pressure in the coil is constant (45psig) and that the refrigerant temperature ranges from 10 °F (when it starts to boil) to 20°F (when boiling is complete). It is then clear that the average temperature for the coil is 15°F. The glide is 10°F (20°F – 10°F)*.

Note: The constant pressure PT chart is similarly helpful when looking at the condensing and sub cooling.

*An average value for the coil temperature is used for simplicity. The actual value tends slightly towards the dewpoint. A future bulletin will discuss the actual value for the coil temperature.

Table 1: Temperature-based PT chart (R-448A)

Solstice N40 (R-448A)			
Temp °F	Bubble	Dew (psig)	Avg
5	39	29	34
10	45	34	39
15	34	33	45
20	38	45	51
25	65	51	58
30	72	57	65
35	80	64	72

Table 2: Pressure-based PT chart (R-448A)

Pressure (psig)	Solstice N40 (R-448A) Temperature		
	°F		
	Avg	Bubble	Dew
35	6	1	11
40	11	6	16
45	15	10	20
50	19	14	24
55	23	18	18

Pressure-based PT charts are now available on the Honeywell Refrigerants website.

Download Complete Retrofit Guide at www.honeywell-refrigerants.com

For more information:

Technical Support Team

800-631-8138

www.honeywell-refrigerants.com

Honeywell Refrigerants

115 Tabor Road

Morris Plains, NJ 07950

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