Refrigerant Pressure–Temperature Chart — R134a, R404A, R410A and R448A/R449A

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Saturation pressure–temperature table for R134a, R404A, R410A and R448A/R449A in bar gauge from " 40 °C to +60 °C, how to use PT values for superheat and subcooling, and what glide means for blends.

Saturation pressures (bar gauge)

The table gives saturation pressure in bar(g) at sea level. For the zeotropic blends R404A, R410A and especially R448A/R449A, liquid (bubble) and vapour (dew) pressures differ; service gauges and controllers use dew point for suction-side superheat and bubble point for liquid-side subcooling. R404A and R410A have near-zero glide, so one column is given; R448A/R449A values are dew-point with the bubble point roughly 4–6 K warmer at the same pressure in the mid range.

°C | R134a | R404A | R410A | R448A/449A (dew) |
" 40 | " 0.49 | 0.33 | 0.76 | 0.28 |
" 35 | " 0.34 | 0.65 | 1.22 | 0.60 |
" 30 | " 0.16 | 1.04 | 1.77 | 0.98 |
" 25 | 0.06 | 1.49 | 2.43 | 1.44 |
" 20 | 0.33 | 2.03 | 3.20 | 1.98 |
" 15 | 0.64 | 2.65 | 4.11 | 2.61 |
" 10 | 1.01 | 3.36 | 5.16 | 3.34 |
" 5 | 1.43 | 4.18 | 6.36 | 4.18 |
0 | 1.93 | 5.11 | 7.73 | 5.14 |
+5 | 2.49 | 6.16 | 9.28 | 6.22 |
+10 | 3.14 | 7.33 | 11.02 | 7.44 |
+15 | 3.87 | 8.65 | 12.96 | 8.81 |
+20 | 4.70 | 10.11 | 15.13 | 10.33 |
+25 | 5.63 | 11.72 | 17.52 | 12.02 |
+30 | 6.66 | 13.50 | 20.17 | 13.89 |
+35 | 7.82 | 15.45 | 23.07 | 15.95 |
+40 | 9.09 | 17.58 | 26.25 | 18.21 |
+45 | 10.51 | 19.92 | 29.72 | 20.69 |
+50 | 12.07 | 22.47 | 33.51 | 23.40 |
+55 | 13.78 | 25.25 | 37.63 | 26.36 |
+60 | 15.66 | 28.27 | 42.12 | 29.58 |

Values are rounded engineering-table figures for service diagnostics; commissioning settings should come from the refrigerant producer's datasheet or calculation software for the exact blend batch.

Using the table

Superheat = measured suction-line temperature " saturation (dew) temperature at the measured suction pressure. Example on R404A: suction pressure 2.65 bar(g) !’ saturation " 15 °C; a pipe temperature of " 7 °C gives 8 K superheat, a healthy figure for a TEV-fed evaporator. Subcooling = saturation (bubble) temperature at the measured liquid pressure " measured liquid-line temperature; 4–8 K indicates a correctly charged condenser. Persistent high superheat with low subcooling points to undercharge or a starving expansion valve — see the catalogue's Danfoss TUA/TUAE expansion valves and service manifolds. Refrigerant is supplied in returnable cylinders such as R134a 12 kg.

Glide in two sentences

A zeotropic blend evaporates and condenses over a temperature range instead of at one point; the difference between dew and bubble temperature at constant pressure is the glide. R448A/R449A glide is about 4–6 K in the useful range, which is why charge must leave the cylinder as liquid and why mid-coil temperature measurements mislead; R404A (Frequently asked questions
What is the pressure of R410A at 0 °C?R410A saturates at approximately 7.7 bar gauge at 0 °C.What is the pressure of R134a at 25 °C?R134a saturates at approximately 5.6 bar gauge at 25 °C — a common quick check for a cylinder at room temperature.How do I calculate superheat with a PT chart?Convert the measured suction pressure to saturation (dew) temperature with the chart, then subtract that from the measured suction-pipe temperature; the difference in kelvin is the superheat.Why must R448A and R449A be charged as liquid?They are zeotropic blends with 4–6 K glide: vapour drawn from a cylinder has a different composition from the blend, so charge always leaves the cylinder as liquid.What subcooling is

normal?Roughly 4–8 K at the condenser outlet indicates a correctly charged system with a full liquid seal; near-zero subcooling suggests undercharge.

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