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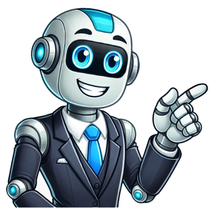

R22 PT chart describes the relationship between temperature and pressure. Namely, it tells you what is the pressure of R22 refrigerant gas at different temperatures. Example: What are R22 pressures on an 85-degree day? You simply consult the R22 RT chart below and see that at 85°F, the pressure of R22 is 155.7 psig. psig or ‘pounds per square inch gauge’ is a pressure unit we usually in refrigerant temperature pressure charts. Measuring R22 pressure on a hot day in our air conditioner. After the PT chart for R22 refrigerant liquid gas, we will look at more of these examples. We will also describe some of the other physical properties of R22 like liquid and gas density, triple point temperature, critical pressure, and heat capacity ratio. We will also explain why R22 is found only in older HVAC devices and is currently being phased out. At the end, we also include a printable R22 PT chart in pdf version; you can print it out and use it on-site. Note: Most common name for this refrigerant is R22, but we can also use HCFC-22, CHCIF2, or chlorodifluoromethane when referencing this particular refrigerant. Here is the full R22 pressure chart from the low side (-60°F) all the way to the high side (155°F): R22 Pressure Temperature Chart Temperature (°F): Temperature (°C): Pressure (psig): -60°F -51.1°C 11.9 psig -55°F -48.3°C 9.2 psig -50°F -45.6°C 6.1 psig -49°F -45.0°C 5.4 psig -48°F -44.4°C 4.8 psig -47°F -43.9°C 4.1 psig -46°F -43.3°C 3.4 psig -45°F -42.8°C 2.7 psig -44°F -42.2°C 1.9 psig -43°F -41.7°C 1.2 psig -42°F -41.1°C 0.4 psig -41°F -40.6°C 0.2 psig -40°F -40.0°C 0.6 psig -39°F -39.4°C 1.0 psig -38°F -38.9°C 1.4 psig -37°F -38.3°C 1.8 psig -36°F -37.8°C 2.2 psig -35°F -37.2°C 2.6 psig -34°F -36.7°C 3.1 psig -33°F -36.1°C 3.5 psig -32°F -35.6°C 4.0 psig -31°F -35.0°C 4.5 psig -30°F -34.4°C 4.9 psig -29°F -33.9°C 5.4 psig -28°F -33.3°C 5.9 psig -27°F -32.8°C 6.4 psig -26°F -32.2°C 6.9 psig -25°F -31.7°C 7.4 psig -24°F -31.1°C 8.0 psig -23°F -30.6°C 8.5 psig -22°F -30.0°C 9.1 psig -21°F -29.4°C 9.6 psig -20°F -28.9°C 10.2 psig -19°F -28.3°C 10.8 psig -18°F -27.8°C 11.4 psig -17°F -27.2°C 12.0 psig -16°F -26.7°C 12.6 psig -15°F -26.1°C 13.2 psig -14°F -25.6°C 13.9 psig -13°F -25.0°C 14.5 psig -12°F -24.4°C 15.2 psig -11°F -23.9°C 15.9 psig -10°F -23.3°C 16.5 psig -9°F -22.8°C 17.2 psig -8°F -22.2°C 17.9 psig -7°F -21.7°C 18.7 psig -6°F -21.1°C 19.4 psig -5°F -20.6°C 20.1 psig -4°F -20.0°C 20.9 psig -3°F -19.4°C 21.7 psig -2°F -18.9°C 22.4 psig -1°F -18.3°C 23.2 psig 0°F -17.8°C 24.0 psig 1°F -17.2°C 24.9 psig 2°F -16.7°C 25.7 psig 3°F -16.1°C 26.5 psig 4°F -15.6°C 27.4 psig 5°F -15.0°C 28.3 psig 6°F -14.4°C 29.2 psig 7°F -13.9°C 30.1 psig 8°F -13.3°C 31.0 psig 9°F -12.8°C 31.9 psig 10°F -12.2°C 32.8 psig 11°F -11.7°C 33.8 psig 12°F -11.1°C 34.8 psig 13°F -10.6°C 35.8 psig 14°F -10.0°C 36.8 psig 15°F -9.4°C 37.8 psig 16°F -8.9°C 38.8 psig 17°F -8.3°C 39.9 psig 18°F -7.8°C 40.9 psig 19°F -7.2°C 42.0 psig 20°F -6.7°C 43.1 psig 21°F -6.1°C 44.2 psig 22°F -5.6°C 45.3 psig 23°F -5.0°C 46.5 psig 24°F -4.4°C 47.6 psig 25°F -3.9°C 48.8 psig 26°F -3.3°C 50.0 psig 27°F -2.8°C 51.2 psig 28°F -2.2°C 52.4 psig 29°F -1.7°C 53.7 psig 30°F -1.1°C 55.0 psig 31°F -0.6°C 56.2 psig 32°F 0°C 57.5 psig 33°F 0.6°C 58.8 psig 34°F 1.1°C 60.2 psig 35°F 1.7°C 61.5 psig 36°F 2.2°C 62.9 psig 37°F 2.8°C 64.3 psig 38°F 3.3°C 65.7 psig 39°F 3.9°C 67.1 psig 40°F 4.4°C 68.6 psig 41°F 5.0°C 70.0 psig 42°F 5.6°C 71.5 psig 43°F 6.1°C 73.0 psig 44°F 6.7°C 74.5 psig 45°F 7.2°C 76.1 psig 46°F 7.8°C 77.6 psig 47°F 8.3°C 79.2 psig 48°F 8.9°C 80.8 psig 49°F 9.4°C 82.4 psig 50°F 10.0°C 84.1 psig 51°F 10.6°C 85.7 psig 52°F 11.1°C 87.4 psig 53°F 11.7°C 89.1 psig 54°F 12.2°C 90.8 psig 55°F 12.8°C 92.6 psig 56°F 13.3°C 94.4 psig 57°F 13.9°C 96.1 psig 58°F 14.4°C 98.0 psig 59°F 15.0°C 99.8 psig 60°F 15.6°C 101.6 psig 61°F 16.1°C 103.5 psig 62°F 16.7°C 105.4 psig 63°F 17.2°C 107.3 psig 64°F 17.8°C 109.3 psig 65°F 18.3°C 111.3 psig 66°F 18.9°C 113.2 psig 67°F 19.4°C 115.3 psig 68°F 20.0°C 117.3 psig 69°F 20.6°C 119.4 psig 70°F 21.1°C 121.4 psig 71°F 21.7°C 123.6 psig 72°F 22.2°C 125.7 psig 73°F 22.8°C 127.8 psig 74°F 23.3°C 130.0 psig 75°F 23.9°C 132.2 psig 76°F 24.4°C 134.5 psig 77°F 25.0°C 136.7 psig 78°F 25.6°C 139.0 psig 79°F 26.1°C 141.3 psig 80°F 26.7°C 143.6 psig 81°F 27.2°C 146.0 psig 82°F 27.8°C 148.4 psig 83°F 28.3°C 150.8 psig 84°F 29.4°C 153.2 psig 85°F 30.0°C 155.7 psig 86°F 30.6°C 158.2 psig 87°F 31.1°C 160.7 psig 88°F 31.7°C 163.2 psig 89°F 31.7°C 165.8 psig 90°F 32.2°C 168.4 psig 91°F 32.8°C 171.0 psig 92°F 33.3°C 173.7 psig 93°F 33.9°C 176.4 psig 94°F 34.4°C 179.1 psig 95°F 35.0°C 181.8 psig 96°F 35.6°C 184.6 psig 97°F 36.1°C 187.4 psig 98°F 36.7°C 190.2 psig 99°F 37.2°C 193.0 psig 100°F 37.8°C 195.9 psig 105°F 40.6°C 210.8 psig 110°F 43.3°C 226.4 psig 115°F 46.1°C 242.8 psig 120°F 48.9°C 260 psig 125°F 51.7°C 278 psig 130°F 54.4°C 296.9 psig 135°F 57.2°C 316.7 psig 140°F 60.0°C 337.4 psig 145°F 62.8°C 359.0 psig 150°F 65.6°C 381.7 psig 155°F 68.3°C 405.4 psig With this R22 PT chart, you can check what pressure R22 refrigerant is at all relevant temperatures. What Are Normal Operating Pressures For R22? We have a low and high operating pressure for R22. Normal operating pressures for R22 are between 260 psig (at 120°F) and 76 psig (at 45°F). The high-end pressure is measured at condensing temperature and the low-end pressure is measured at evaporator saturation temperature. Beyond this pressure window, you have an R22 pressure chart for the high and low side above. At the low side, the R22 pressure can fall below 10 psid+g. At the high side, the operating pressures of R22 can reach above 300 psig. Let’s check some examples of what the pressure of R22 is at various temperatures: R22 Pressures On A 65-Degree Day? On a 65°F day, the pressure of R22 is 111.3 psig. This is within the normal operating pressure for an R22 refrigerant. R22 Pressures On A 70-Degree Day? On a 70°F day, the pressure of R22 is 111.3 psig. R22 Pressures On A 75-Degree Day? On a 75°F day, the pressure of R22 is 132.2 psig. R22 Pressures On A 80-Degree Day? On an 80°F day, the pressure of R22 is 143.6 psig. R22 Pressures On A 85-Degree Day? On an 85°F day, the pressure of R22 is 155.7 psig. R22 Pressures On A 90-Degree Day? On a 90°F day, the pressure of R22 is 168.4 psig. R22 Pressures On A 95-Degree Day? On a 95°F day, the pressure of R22 is 181.8 psig. R22 Pressures On A 100-Degree Day? On a 100°F day, the pressure of R22 is 195.9 psig. Needless to say, the temperature of the R22 in the refrigerant lines can be higher than the day’s temperature. Physical Properties Of R22 In parallel to using the R22 PT chart, professionals will usually need to know some of the following R22 physical properties: R22 liquid density at -69°C: 1.49 g/cm3. R22 gas density at 15°C: 3.66 kg/m3. Triple point temperature: -115.76K. Critical pressure: 49.36 bar. Heat capacity ratio at 86°F: 1.178253 Note Of R22 Phasing Out R22 is slowly phasing out. You will find this refrigerant in many older HVAC devices such as air conditioners and refrigerators. However, the chemical molecule (difluoromonochloromethane) itself is an organofluorine and therefore dangerous to the environment, having ozone depletion potential and high global warming potential. The phasing out of R22 is happening according to the Montreal protocol. This protocol states that in developed countries like USA and Europe, the R22 will be phased out in 2020. In undeveloped countries, the phasing out deadline is 2030. R22 PT Chart PDF (Printable PDF For On-Site Use) As promised, you can get the printable PDF version of R22 PT chart here if you need it on-site: Get Printable R22 PT Chart PDF Here Hopefully, you now have enough information about R22 pressures at different temperatures. You can check a similar table for: One of the very first steps when it comes to diagnosing your home air conditioner, refrigerator, or even your vehicle’s air conditioner is understanding the temperature and the current pressure that your system is operating at. Having these facts along with the saturation point, the subcool, and the superheat numbers for the refrigerant you are working on are essential when it comes to really understanding what is going wrong with your system.After a visual inspection the very next step for the most seasoned technicians is pulling out their gauges and checking the pressure and temperature. It just becomes second nature after enough calls. I have heard stories of rookie techs calling some of the pros on their team for help on a system that they’re stuck on. It doesn’t matter what the situation is. It doesn’t matter if you’re in Miami or in Fargo. It will never fail that one of the first questions the pros ask the rookie is what is your subcool and what is your superheat? Having and understanding these numbers is key to figuring out what to do next.But, these numbers won’t do you any good if you don’t know what refrigerant you are dealing with and what the refrigerant’s boiling point is at each pressure level. This article aims at providing you with just that information.R-22 HistoryR-22 refrigerant is the major refrigerant, or... it was. R-22 was invented by a partnership with General Motors and DuPont back in the 1930’s. In the 1950’s the use of R-22 exploded and for nearly sixty years it was THE refrigerant to be used in home, office, and commercial air conditioning. Along with air conditioning it was also used in chillers, ice rinks, and many other applications.It was in the 1980’s that it was discovered that R-22 was damaging the Ozone layer with the chlorine that it contained. In order to correct this R-22 was phased out across the world. Here in America our phase out began in 2010 and the refrigerant will be completely phased out in 2020. Taking R-22’s place is the HFC refrigerant blend known as R-410A, our Puron.As I write this article, in 2019, there are still thousands of R-22 machines out there, but they are a dying breed and within the next ten to twenty years R-22 will be as rare to find as R-12 is today.If you would like to read more about R-22 Freon please have a look at our R-22 Freon refrigerant fact sheet.R-22 PT ChartLet’s take a look at the complete pressure table for R-22 below.°F°CPSIKPA-40-40.00.53.4-35-37.22.617.9-30-34.44.933.8-25-31.77.451.0-20-28.910.169.6-15-26.113.291.0-10-23.316.5113.8-5-20.620.1138.60-17.824165.55-15.028.2194.410-12.232.8226.115-9.437.7259.920-6.743296.525-3.948.8336.530-1.154.9378.5351.761.5424.0404.468.5472.3457.276524.05010.084579.25512.892.6638.56015.6102703.36518.3111765.37021.1121834.37523.9132910.18026.7144992.88529.41561075.69032.21681158.39535.01821254.810037.81961351.410540.62111454.811043.32261558.211546.12431675.412048.92601792.612551.72781916.713054.42972047.713557.23172185.614060.03372323.514562.83592475.215065.63822633.8ConclusionThere you have it folks. I hope this article was helpful and if you find that something is inaccurate here in my chart please do not hesitate to reach out to me. I have sourced this the best I could but there is always going to be conflicting data. I’ve seen it multiple times on various refrigerants. I’ll search for a refrigerant’s pressure chart and get various results all showing different pounds per square inch temperatures.The aim with this article is to give you accurate information so again, if you see anything incorrect please contact us. On top of this post we are also working on a comprehensive refrigerant pressure/temperature listing. The goal is to have every refrigerant out there listed with a pressure/temperature chart that is easily available. Hello readers welcome to the new post. Here we will discuss the R22 Pressure Temperature Chart. R22 PT chart was used to make the relationship between pressure and temperature. It is used to explain the value of pressure of R22 refrigerant for a certain value of temperature. These values of temperature and pressure are used to diagnose the working of refrigerant and air conditioners. Let’s get started with the R22 Pressure Temperature Chart. Pressure-Temperature Data for R-22 (psig) Temp. (°F) Temp. (°C) Pressure (psig) Temp. (°F) Temp. (°C) Pressure (psig) Temp. (°F) Temp. (°C) Pressure (psig) Temp. (°F) Temp. (°C) Pressure (psig) -49 -45.0 5.4 1 -17.2 24.9 51 10.6 85.7 101 38.3 198.8 -48 -44.4 4.8 2 -16.7 25.7 52 11.1 87.4 102 38.9 201.8 -47 -43.9 4.1 3 -16.1 26.5 53 11.7 89.1 103 39.4 204.7 -46 -43.3 3.4 4 -15.6 27.4 54 12.2 90.8 104 40.0 207.7 -45 -42.8 2.7 5 -15.0 28.3 55 12.8 92.6 105 40.6 210.8 -44 -42.2 1.9 6 -14.4 29.2 56 13.3 94.4 106 41.1 213.8 -43 -41.7 1.2 7 -13.9 30.1 57 13.9 96.1 107 41.7 216.9 -42 -41.1 0.4 8 -13.3 31.0 58 14.4 98.0 108 42.2 220.0 -41 -40.6 0.2 9 -12.8 31.9 59 15.0 99.8 109 42.8 223.2 -40 -40.0 0.6 10 -12.2 32.8 60 15.6 101.6 110 43.3 226.4 -39 -39.4 1.0 11 -11.7 33.8 61 16.1 103.5 111 43.9 229.6 -38 -38.9 1.4 12 -11.1 34.8 62 16.7 105.4 112 44.4 232.8 -37 -38.3 1.8 13 -10.6 35.8 63 17.2 107.3 113 45.0 236.1 -36 -37.8 2.2 14 -10.0 36.8 64 17.8 109.3 114 45.6 239.4 -35 -37.2 2.6 15 -9.4 37.8 65 18.3 111.3 115 46.1 242.8 -34 -36.7 3.1 16 -8.9 38.8 66 18.9 113.2 116 46.7 246.1 -33 -36.1 3.5 17 -8.3 39.9 67 19.4 115.3 117 47.2 249.5 -32 -35.6 4.0 18 -7.8 40.9 68 20.0 117.3 118 47.8 253.0 -31 -35.0 4.5 19 -7.2 42.0 69 20.6 119.4 119 48.3 256.5 -30 -34.4 4.9 20 -6.7 43.1 70 21.1 121.4 120 48.9 260.0 -29 -33.9 5.4 21 -6.1 44.2 71 21.7 123.6 121 49.4 263.5 -28 -33.3 5.9 22 -5.6 45.3 72 22.2 125.7 122 50.0 267.1 -27 -32.8 6.4 23 -5.0 46.5 73 22.8 127.8 123 50.6 270.7 -26 -32.2 6.9 24 -4.4 47.6 74 23.3 130.0 124 51.1 274.3 -25 -31.7 7.4 25 -3.9 48.8 75 23.9 132.2 125 51.7 278.0 -24 -31.1 8.0 26 -3.3 50.0 76 24.4 134.5 126 52.2 281.7 -23 -30.6 8.5 27 -2.8 51.2 77 25.0 136.7 127 52.8 285.4 -22 -30.0 9.1 28 -2.2 52.4 78 25.6 139.0 128 53.3 289.2 -21 -29.4 9.6 29 -1.7 53.7 79 26.1 141.3 129 53.9 293.0 -20 -28.9 10.2 30 -1.1 55.0 80 26.7 143.6 130 54.4 296.9 -19 -28.3 10.8 31 -0.6 56.2 81 27.2 146.0 131 55.0 300.8 -18 -27.8 11.4 32 0.0 57.5 82 27.8 148.4 132 55.6 304.7 -17 -27.2 12.0 33 0.6 58.8 83 28.3 150.8 133 56.1 308.7 -16 -26.7 12.6 34 1.1 60.2 84 28.9 153.2 134 56.7 312.6 -15 -26.1 13.2 35 1.7 61.5 85 29.4 155.7 135 57.2 316.7 -14 -25.6 13.9 36 2.2 62.9 86 30.0 158.2 136 57.8 320.7 -13 -25.0 14.5 37 2.8 64.3 87 30.6 160.7 137 58.3 324.8 -12 -24.4 15.2 38 3.3 65.7 88 31.1 163.2 138 58.9 329.0 -11 -23.9 15.9 39 3.9 67.1 89 31.7 165.8 139 59.4 333.2 -10 -23.3 16.5 40 4.4 68.6 90 32.2 168.4 140 60.0 337.4 -9 -22.8 17.2 41 5.0 70.0 91 32.8 171.0 141 60.6 341.6 -8 -22.2 17.9 42 5.6 71.5 92 33.3 173.7 142 61.1 345.9 -7 -21.7 18.7 43 6.1 73.0 93 33.9 176.4 143 61.7 350.3 -6 -21.1 19.4 44 6.7 74.5 94 34.4 179.1 144 62.2 354.6 -5 -20.6 20.1 45 7.2 76.1 95 35.0 181.8 145 62.8 359.0 -4 -20.0 20.9 46 7.8 77.6 96 35.6 184.6 146 63.3 363.5 -3 -19.4 21.7 47 8.3 79.2 97 36.1 187.4 147 63.9 368.0 -2 -18.9 22.4 48 8.9 80.8 98 36.7 190.2 148 64.4 372.5 -1 -18.3 23.2 49 9.4 82.4 99 37.2 193.0 149 65.0 377.1 0 -17.8 24.0 50 10.0 84.1 100 37.8 195.9 150 65.6 381.7 Most engineers and technicians in HVAC know the normal range of working low-pressure of ac systems. That is about 60 PSI to 85 PSI for R-22 and can be 105 PSI to 143 PSI for R-410A based on working conditions. The suction pressure of AC for R22 refrigerant is about 60 TO 70 PSI and the discharge pressure is 250 TO 300. R22 is a colorless, odorless gas and has a boiling point of about -41.44°F (-40.8°C). R22 refrigerant gas Difluorochloromethane composed another name is Monochlorodifluoromethane, freon, with short-form HCFC-22, and CHClF2 as its chemical formula. R22 refrigerant gas is hydrogen having chlorofluorocarbon, which is a colorless gas having a sweet smell. The conventional PT chart defines the saturated refrigerant pressure, in Psig with a column of pressure on the left side. Single refrigerant components and azeotropes boil and condense at a single temperature for a given pressure. The details used for measuring the amount of Freon in residential AC units is 2 to four pounds per ton of cooling. Such as if you connect a new AC system rated for 5 ton load system will need 10-20 pounds of refrigerant. R22 or R134a can be charged in any way The suction pressure must be kept at less than 200mmHg for adults. it must be set at 80mmHg to 120mmHg in neonates. The catheter size for suction must be less than fifty percent of the inner diameter of the endotracheal tube. The common conversion is one mm diameter tha is equal to 3 French. R22a is a hydrogen refrigerant blend with main components like flammable materials like propane and butane. In some conditions, it also has a small quantity of hydrocarbons or a pine-scented odorant. It is a highly flammable, colorless gas that is heavier than air Chlorodifluoromethane or difluoromonochloromethane is a hydrochlorofluorocarbon (HCFC). It is a colorless gas and called HCFC-22, or R-22, or CHClF. 2. . It is used as a propellant and refrigerant. R-22 is an HCFC refrigerant used in air conditioner instruments. To protect the earth’s ozone layer the USA is phasing out R22 with other chemicals. It has Chlorodifluoromethane the HCFC material that harms the health and environment through destroying ozone in upper temperatures. Ozone layer destruction can cause an increment in UV radiation that can cause skin cancer and eye cataracts. If you have an AC system more than ten years old there can be a chance of R22 use and that is known as Freon. R22 is an A/C refrigerant used in AC systems for cooling. Boiling point -40.8 ℃ Critical temperature 96.24℃ Gas Density 3.03 Liquid Density 1.194 g/cm3（25 ℃）Ozone Depletion Potential (ODP) 0.034 Global Warming Potential(GWP) 100Years 1700 ASHARE Security classification A1/A1 Flammability (1 standard atmospheric pressure. , 18 ℃) Non-flammable Critical pressure 4980kPa Smell Slight odor Morphology Liquefied Gases Color Clean, colorless Latent heat of evaporation (at boiling point conditions) 233KJ/kg Evaporation Pressure 1044kPa（25 ℃）The R22 refrigerant causes cooling in ac unit and if gas leaks out ac stops the cooling process. That causes the refrigerant leak R22 is a refrigerant that is used in AC systems. Since R22 affects the ozone layer. It is production is limited and in 2020 R22 will not made. After 2020 only recovered, recycled, or reclaimed supplies of R-22 is available. We cannot replace these two since R410-A and R-22 come with different chemical features. R410-A works at high pressure. If we put R410A in the R22 system, the component will rupture due to high force. R22 is not used for installing new AC systems since it was stopped to use in 2010 due to the nature of hydro-chlorofluorocarbon (HCFC). R22 refrigerant gas is used for making tetrafluoroethylene and refrigerant, aerosol, and it is also used for making pesticides. Sometime ago R22 refrigerant gas was also used for refrigeration instruments like AC, outdoor condensing units, HVAC units, etc. It is also used for food storage and processing, ice machines, and transportation refrigeration. In this article, we will discuss an HVAC unit’s refrigerant pressure on both the high side and the low-pressure side while the system runs. It is important to know the range of these pressures in order to understand why and how charging and recovery are performed. The first thing to realize is that when a system is off and equalized, the system’s pressures on both the high side and the low-pressure side will match. In the example of an R-410A packaged unit with a surrounding air temperature of 70°F, the pressure on both the high and low-pressure side of the system will be 201 PSIG. If a new R-410A refrigerant bottle had a surrounding air temperature of 70°F, the pressure inside the bottle would be 201 PSIG. Likewise, an R-410A recovery bottle with a surrounding air temperature of 70°F should have an internal pressure of 201 PSIG. Remember that temperature will affect the pressure of a refrigerant. If the air temperature surrounding the refrigerant increases, the refrigerant will absorb that heat and increase in temperature. This will cause the pressure of the refrigerant to rise. For example, if the packaged unit’s surrounding air temperature rises to 75°F, the pressure on both the high and low-pressure side of the system will rise to approximately 208 PSIG. If a new R-410A refrigerant bottle had a surrounding air temperature of 75°F, the pressure inside the bottle would be 208 PSIG. Likewise, an R-410A recovery bottle with a surrounding air temperature of 75°F should have an internal pressure of 217 PSIG. When an air conditioning system turns on, the large vapor line will lower in pressure while the small liquid line will rise in pressure. We will first examine the low-pressure side of the system, otherwise known as the vapor suction line. During air conditioning mode, the pressure in the vapor line of an R-410A system will be somewhere between 102 to 145 PSIG. If the system had R-22, the vapor pressure would be between 58 to 85 PSIG but these pressures will be dependent on the wet bulb temperature inside the building and the ambient temperature outside the building. The indoor wet bulb temp shows the heat load on the inside of the building because it takes into consideration both temperature and humidity. The higher the heat load on the inside of the building, the higher the pressure will be on the vapor line. Likewise, the higher the outdoor air temperature is, the less heat the system can reject outside. This also results in a higher vapor pressure. Learn more about indoor wet bulb temp and outdoor dry bulb temp and how they affect charging in our book “Refrigerant Charging and Service Procedures for Air Conditioning”. Other major factors that affect the vapor pressure are the type of metering device and the indoor airflow. Where techs get into trouble is when they try to guess these pressures when checking the charge of a system. To learn the correct ways for checking the charge, make sure to read the Subcooling Method article and the Total Superheat Method article! Anyway, getting back to this article, if the air conditioning system had R-410A, we know the pressure on the low side of the system will be between 102 and 145 PSIG regardless of the heat load conditions (except for extreme circumstances). If the outdoor temperature is 70°F, a refrigerant bottle outside would have a pressure of roughly 201 PSIG. If the outdoor temperature is 110°F, a refrigerant bottle outside would have a pressure of roughly 366 PSIG. In any instance, the pressure inside the new refrigerant bottle will be higher than the pressure on the vapor/suction line of a running system. Because of this, the refrigerant from the new bottle will exit the bottle and enter the system as long as the system is running and only if the service valve on the manifold connecting the two is opened. The picture below shows a system running on a 85°F day that had 6 ounces of R-410A added. In the picture, the manifold valve to the blue hose is closed so the blue gauge is measuring the pressure inside the running system. The vapor pressure is 118 PSIG and because it is 85°F outside, the R-410A bottle pressure is 254 PSIG. The pressure in the bottle is much higher than the pressure on the low side of the system so if they are connected, refrigerant will exit the bottle and enter the system. When the system is off and the pressure in the system matches the bottle pressure, the only way the refrigerant would exit the bottle and enter the system is if a bottle warmer is used to increase the temperature of the bottle. This will increase the pressure of the bottle to a higher pressure than is in the inside of the system. This would allow for slow charging while the system is off. However, the technician needs to be able to check the charge while adding refrigerant in order to know how much to add unless they are charging by weight per foot of line set. In order to learn more about charging by weight, read this article on the Total Weight Method. The only time a technician would add refrigerant into the liquid line of an air conditioning system is if the system is off, empty, and vacuumed. Technicians use the total weight method to break the vacuum of a system with the correct amount of refrigerant needed based on the added line set length. Refrigerant is added into the liquid line for two reasons. One is because the liquid line is small in interior volume so there is a better chance of weighing the full amount of liquid refrigerant needed into the unit. This is because the liquid line is small and will not allow the refrigerant to vaporize as quickly as the larger vapor line would. Remember that after the refrigerant vaporizes, it will apply pressure inside the system and this pressure will increase to the same pressure as the pressure inside the bottle. This will stop the refrigerant from flowing from the bottle into the system. The other reason liquid refrigerant is added into the liquid line of an off, empty, and vacuumed system is so that when the system starts up, the compressor will not get slugged with liquid refrigerant. If the refrigerant is added into the liquid line, the refrigerant will have to make its way through the metering device before it can enter the vapor line. This allows less saturated refrigerant to be inside the vapor line for the initial start-up. This will keep the vapor compressor safer from having liquid refrigerant enter it. As far as recovering a small amount of refrigerant from a running system, this can be done without a recovery machine by connecting the liquid line of the running system to the recovery bottle. However, this method should not be used for recovering large amounts of refrigerant because mixed in with the high-pressure liquid will be the system’s oil. Remember that the system's oil circulates through the inside of the system with the refrigerant and is carried along by the refrigerant. In cases where a large amount of refrigerant needs to be recovered, make sure to use a recovery machine while the system is off. You can learn more about this setup in our book “Refrigerant Charging and Service Procedures for Air Conditioning”. The liquid line on a running system will have a higher pressure than the pressure inside the recovery bottle as long as the recovery bottle does not have air, nitrogen, or a mix of multiple refrigerants inside. It is very important to check the pressure of a recovery bottle before using it to recover refrigerant from the system. If the recovery bottle has air in it, the pressure may be higher than the pressure on the liquid line of a running system. If the recovery bottle is connected to the liquid line of a running system in an attempt to recover a little bit of refrigerant from the system, it may allow the air and refrigerant mix to exit the bottle and enter the system instead of the refrigerant exiting the system and entering the bottle. It is crucial to check the recovery bottle pressure before use! To learn more about contaminated refrigerant problems, check out our book! On a running system, the liquid pressure does not have a consistent range like the vapor pressure does. This is because the outdoor temperature swing is much larger than the indoor temp swing. For instance, it may be anywhere from 68 to 80°F inside the building but outside, it may be anywhere from 65 to 110°F. Also, the liquid pressure will be dependent on the SEER rating, fin condition, shading, and outdoor airflow. If a technician is trying to guess what this pressure should be when trying to check the charge, they may be very far off compared to an actual refrigerant charging method. In our book we go over many of the methods that have been used to try to short cut checking the refrigerant charge the correct way. For each of these methods, we lay out what the disadvantages are. To wrap this up, when we charge refrigerant into a running system, we add the new refrigerant into the vapor line slowly and check the charge as we go. If we want to recover a small amount of refrigerant from a running system, we first CHECK THE PRESSURE of the recovery bottle and then we can de-charge (recover) the refrigerant from the system by connecting the liquid line to the recovery tank and we meter the refrigerant into the recovery bottle slowly using our manifold gauge set valve. Always recover slowly with this method because it will occur quickly due to the liquid state of the refrigerant in the liquid line. Don’t recover a large amount of refrigerant in this manner because a large amount of oil will be removed from the system. If a large amount of refrigerant needs to be recovered, turn the system off and connect a recovery machine from the system to the recovery bottle. If you want to learn more about all the fine details on charging methods and troubleshooting, check out our book which is available on our website and on amazon. The Content Chargers Use Cookies Accept Learn more about our cookie policy. Chapter 1 Introduction Chapter 2 Refrigerant Charging Methods, check out our book! If you want to learn more about Superheat and Subcooling Charging Methods, check out our book! If you want to learn more about Delta T, check out this article. Follow us on Facebook @ServicechFollow us on Facebook @ServicechFollow us on Facebook here!Published: 6/24/2021 Author: Craig Migliaccio Refrigerants play a crucial role in the proper functioning of HVAC systems. Among the various refrigerants available, R22 has been widely used in both residential and commercial air conditioning units. However, with the recognition of its harmful environmental impact, R22 is being phased out and replaced by more eco-friendly alternatives. Nonetheless, there are still many HVAC professionals who work with systems that use R22 refrigerant, and understanding the correct operating pressure for R22 is essential for their work. In this article, we will delve into the details of R22 refrigerant and provide valuable information on its correct operating pressure. Exploring R22 Refrigerant Understanding the Basics Before delving into the correct operating pressure for R22 refrigerant, it is important to understand the basics of this particular refrigerant. R22, also known as chlorodifluoromethane, belongs to the class of hydrochlorofluorocarbons (HCFCs). It has been widely used since the 1950s due to its excellent heat transfer properties and stability. R22 is known for its ability to absorb heat from the surrounding air and release it outside, thereby providing cooling effects in air conditioning systems. The Phasing Out Process Despite its effectiveness in cooling, R22 has come under scrutiny due to its detrimental impact on the ozone layer. The chlorine atoms present in R22 molecules contribute to ozone depletion, causing environmental harm. As a result, the production and import of R22 have been phased out under the Montreal Protocol and subsequent regulations. These environmental concerns have led to the development of alternative refrigerants that have lower global warming potentials (GWPs) and ozone depletion potentials (ODPs). Existing Systems with R22 Refrigerant While the phasing out of R22 is in progress, many HVAC systems in use today still rely on this refrigerant. These systems are often older and may have been installed before the transition to more environmentally friendly options. It is crucial for HVAC professionals to understand how to work with R22 systems, including knowing the correct operating pressure for R22 refrigerant. The Correct Operating Pressure for R22 Refrigerant Known Pressure Ranges To ensure the efficient operation of an HVAC system using R22 refrigerant, it is vital to maintain the correct operating pressure. The operating pressure of R22 depends on several factors, including the ambient temperature, suction pressure, discharge pressure, and the type of system being used. The typical operating pressure range for R22 refrigerant in an air conditioning system is around 68 to 70 pounds per square inch gauge (psig) on the low side and 250 to 260 psig on the high side. It is important to note that these values are approximate and can vary based on specific system conditions. HVAC professionals should always consult the manufacturer’s guidelines and system specifications for accurate pressure values. Ambient Temperature Considerations One of the significant factors affecting the correct operating pressure of R22 refrigerant is the ambient temperature. As the outdoor temperature fluctuates, the pressure within the HVAC system changes accordingly. To compensate for these temperature variations, HVAC professionals need to understand the relationship between ambient temperature and the operating pressure of R22. As a general rule, the operating pressure decreases as the outdoor temperature drops and increases when the temperature rises. This correlation assists technicians in diagnosing potential issues within the system. However, accurate pressure measurements require precise tools and instruments. Importance of Correct Operating Pressure Maintaining the correct operating pressure for R22 refrigerant is essential for several reasons. Firstly, it ensures optimal cooling performance by allowing the system to absorb and release heat efficiently. This, in turn, increases the overall energy efficiency of the HVAC unit, minimizing power consumption and reducing the associated costs. Secondly, operating the system within the recommended pressure range helps prevent refrigerant leaks and system breakdowns. If the pressure deviates too much from the ideal range, it can lead to stress on the system components, potentially causing damage and requiring costly repairs. Additionally, understanding and adhering to the correct operating pressure for R22 refrigerant is crucial to ensure the safety of the HVAC professionals and the end-users. Deviating from the recommended pressure range can lead to system malfunctions and potentially dangerous situations, such as refrigerant leaks or system failures. Monitoring and Maintaining the Correct Operating Pressure Regular Pressure Checks To ensure the correct operating pressure for R22 refrigerant, HVAC professionals should conduct regular pressure checks as part of routine maintenance. Monitoring the system pressures helps in identifying any abnormalities or potential issues before they escalate into major problems. Using reliable and accurate pressure gauges and other measurement tools, technicians can measure the suction pressure, discharge pressure, and overall system pressure. By comparing these measurements with the recommended pressure ranges, they can determine if any adjustments or repairs are necessary. Effect of Refrigerant Charge Another critical factor affecting the operating pressure of R22 refrigerant in an HVAC system is the refrigerant charge. The refrigerant charge refers to the precise amount of refrigerant present in the system. If the system is overcharged or undercharged, it can significantly impact the operating pressure and overall performance of the HVAC unit. To maintain the correct operating pressure, HVAC professionals must ensure the accurate refrigerant charge. This task requires a thorough understanding of the specific system and its refrigerant requirements. Overcharging or undercharging the system can lead to reduced efficiency, increased energy consumption, and potential damage to the compressor. Professional Expertise Given the complexities involved in monitoring and maintaining the correct operating pressure for R22 refrigerant, it is crucial to rely on the expertise of HVAC professionals. These professionals are trained, certified, and experienced in working with various refrigerants, including R22. They possess the necessary knowledge and skills to accurately measure and adjust system pressures, ensuring optimal performance and safety. In conclusion, understanding the correct operating pressure for R22 refrigerant is essential for HVAC professionals working with systems that still use this refrigerant. Adhering to the recommended pressure ranges, considering ambient temperature variations, and conducting regular pressure checks are vital for efficient and safe operation. By monitoring and maintaining the correct operating pressure, HVAC professionals can ensure the longevity and optimal performance of the R22 systems they work with. High side reads about 250 give or take at 90 degrees ambient temperature. Low side reads 43. Using farthest outside scale on gauge. generally it should be around 225 on the high side and near 70 on the low. Keeping this in consideration, what should my Pressures be for r22? Example R-22 Refrigerant Temperature vs Pressure Data Ambient Temperature in °F1 R22 Vapor Pressure at Sea Level R-22 Low Side Pressure2 95°F (35°C) 181.9 psig 68 psi 1 Pressure (lbs.) 75°F (43.3°C) 226.4 psig 150°F (65.6°C) 381.7 psig Additionally, what is the suction and discharge pressure for r22? For example, a high-efficiency condensing unit using R-22 typically operates with a suction pressure of about 68 psi and a discharge pressure of about 250 psi at an outdoor temperature of 95°F. Herein, what should the high and low side pressures be? The low-side should be near 30 PSI at 90 degrees Fahrenheit or less. Pressure (lbs.) 75°F (43.3°C) 226.4 psig 150°F (65.6°C) 381.7 psig Additionally, what is the suction and discharge pressure for r22? approximately 10F This guide dives into the crucial relationship between pressure and temperature in R22 refrigerant systems, offering practical advice and troubleshooting tips. Even though R22 is being phased out, understanding its properties remains essential for maintaining existing systems. Whether you’re an HVAC professional or a homeowner, this guide will equip you with the knowledge to keep your R22 system running smoothly.Decoding R22 Pressure-Temperature RelationshipsWhat is an R22 Pressure Temperature (P/T) Chart?An R22 P/T chart is a vital tool that decodes the relationship between the pressure and temperature of R22 refrigerant. It’s essentially a roadmap for understanding how these two factors interact within your AC system. By comparing your system’s actual readings with the chart’s values, you can effectively diagnose potential issues and ensure efficient operation. Think of it as a translator, converting the complex language of your AC into something readily understandable.How to Use an R22 P/T ChartUsing a P/T chart is surprisingly straightforward. First, measure your system’s temperature. Then, locate that temperature on the chart and find the corresponding pressure value. Simple, right? But the real power of the chart comes into play when the readings don’t match up. Discrepancies between expected and actual values can point towards a variety of problems, giving you a head start in troubleshooting.Factors Influencing R22 PressureWhile temperature is a primary driver, other factors can also influence R22 pressure:Ambient Temperature: The temperature surrounding the unit plays a significant role. Higher ambient temperatures