R 22 Pressure Chart High And Low Side

Introduction

R-22, also known as chlorodifluoromethane, has been a staple refrigerant in HVAC systems for decades. Even as newer, more environmentally friendly alternatives gain popularity, many existing installations still rely on R-22. One of the most critical tools for technicians working with this refrigerant is the **R-22 pressure chart high and low side**, which provides a quick reference to the expected pressure ranges during operation. Understanding how to read and interpret this chart is essential for diagnosing performance issues, ensuring system safety, and maintaining optimal efficiency.

Understanding the R-22 Refrigeration Cycle

The refrigeration cycle for R-22 involves four main components: the compressor, condenser, expansion device, and evaporator. Each stage transforms the refrigerant's temperature and pressure, creating the cooling effect that keeps buildings comfortable. The compressor raises the pressure and temperature of the gas, the condenser releases heat to the surroundings, the expansion device reduces the pressure, and the evaporator absorbs heat from the indoor air.

What Is a Pressure Chart?

A pressure chart is a graphical or tabular representation of the pressure and temperature relationships within a refrigeration system. For R-22, the chart typically displays two key pressure zones:

- **High side pressure** – the pressure after the compressor, before the condenser.
- **Low side pressure** – the pressure after the expansion device, before the evaporator.

By comparing measured gauge readings to the chart, technicians can quickly determine whether a system is operating within normal parameters.

R-22 Pressure Chart: High Side vs Low Side

High Side Pressure

The high side pressure is influenced by the compressor's discharge pressure, condenser temperature, and the ambient load. In a typical residential unit, the high side may range from 200 to 400 psi during normal operation. However, this range can shift based on factors such as:

- Ambient temperature
- Condenser coil cleanliness
- Compressor age and condition

Low Side Pressure

The low side pressure is affected by the evaporator temperature, expansion valve performance, and the amount of refrigerant present. For R-22, low side pressures usually fall between 20 and 60 psi in standard installations. Deviations from this range often signal issues such as:

- Overcharging or undercharging the system
- Blockages in the evaporator coil
- Malfunctioning expansion device

Typical Pressure Ranges

Below is a simplified overview of expected pressure ranges for a 12-ton R-22 system operating at a 70°F outdoor temperature:

1. **High side discharge pressure:** 250–350 psi
2. **Low side suction pressure:** 30–50 psi

Factors Affecting Pressure

Several variables can alter the pressures recorded on the R-22 pressure chart:

- Refrigerant charge (overcharge increases both high and low side pressures)
- System leaks (often lower pressures on both sides)
- Electrical supply fluctuations (can cause compressor performance variations)
- Seasonal temperature swings (high side pressure rises with hotter outdoor air)

How to Read the R-22 Pressure Chart

Reading the chart involves a few straightforward steps:

1. **Take accurate gauge readings:** Use calibrated pressure gauges on the suction and discharge lines.
2. **Locate the temperature:** Measure the ambient or coil temperature that corresponds to the chart's temperature axis.
3. **Cross-reference:** Find the intersection of the temperature and pressure readings on the chart.
4. **Assess the result:** If the measured pressures fall within the chart's shaded "normal" area, the system is likely operating correctly. Outside this area, investigate potential causes.

Common Issues and Troubleshooting

When the R-22 pressure chart high and low side readings fall outside expected ranges, consider the following troubleshooting steps:

- **Check for leaks:** Low side pressure may drop if refrigerant escapes.
- **Verify refrigerant charge:** Use a manometer to confirm the correct charge.
- Inspect the condenser coil for fouling, which can raise high side pressure.
- Examine the expansion device for proper operation; a stuck valve can alter low side pressure.
- Ensure the compressor is functioning correctly; a failing motor can distort high side readings.

Safety and Environmental Considerations

R-22 is a chlorofluorocarbon (CFC) that contributes to ozone depletion. Many countries have phased it out under the Montreal

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Protocol. While existing systems can still be serviced, technicians should:

- Wear appropriate personal protective equipment (PPE).
- Follow local regulations for refrigerant handling and disposal.
- Use