Transcritical CO₂ Booster System

This model shares the same R-744 (CO₂) as a direct refrigerant in both the MT and LT systems. The LT compressors act as boosters and discharge into the suction of the MT compressors. At ambient temperatures above approximately 73°F, the compressors discharge the gas above its critical pressure of R-744 1055 psig (73 bar). The condenser then acts as a gas cooler and reduces the temperature of the discharge gas without condensing it into liquid. Cooled vapor passes through a high pressure reducing valve, at which point a portion condenses into liquid and the rest remains as gas. Liquid and gas are separated in a flash tank (receiver). Pressure in the flash tank is typically controlled to 450 to 500psig (30 to 35 bar).

The liquid is then distributed to the MT and LT cabinets via the liquid line at this intermediate pressure. The flash gas is taken via an additional expansion device to the suction of the MT compressors. A separate flash gas compressor may be an adequate method to raise system efficiency in warmer regions.

**Typical CO₂ Transcritical Booster System**