

INCREASE IN THE C.O.P. & REDUCTION IN THE CONDENSER SIZE OF NH₃ V.C.R CYCLE BY MEANS OF THE LIQUID INJECTION IN THE COMPRESSOR AND USE OF CENTRIFUGAL COMPRESSOR

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Abstract

In conventional NH₃ vapour compression refrigerating (VCR) system because of high specific heat of NH₃ it becomes more superheated after compression as compare to other refrigerants for same compression ratio and inlet temperature, which leads to material and lubrication problems and lead to more consumption of compressor energy because of increased temperature range. These problems may be eliminated by injecting some part of liquid ammonia coming out from the condenser into the compressor. The following effects can be observed:

1. Liquid injection into compressor keeps the temperature of the vapour low, which reduces energy consumption of compressor.
2. For the same refrigerating effect reduction in compressor energy, increases the coefficient of performance (COP) of the system.
3. The use of liquid injection eliminates the need of desuperheater (part of condenser which removes superheat of refrigerant). Elimination of desuperheater reduces size of condenser which ultimately results in reduction in capital cost and weight of condenser.

Keywords: Compressor, Coefficient of Performance, Liquid injection, condenser, throttling valve, Refrigerant