

Case Study

Dade County, Florida-Public Libraries

Free Hot Water for Reheat Humidity Control for Two County Libraries in Florida, USA



Kendal Library



Naranja Library

Southeast Florida can be very challenging when designing an air conditioning and ventilation system due to the high humidity that comes from a tropical climate with a design wet bulb temperature of 80°F. The design engineers that work for the GSA were looking for a solution to provide air conditioning and humidity control for two new libraries and at the same time reduce capital and energy costs.

The Dunham-Bush Latin American and HVAC/R International, Inc offices located in Miami, Florida presented a solution for the Kendal and Naranja Libraries that included (1) Dunham-Bush air cooled chiller **ACDSB** rated for 78.49 TR at ARI conditions for the Kendal Library and (1) Dunham-Bush air cooled chiller **ACDSB** rated for 72.13 TR at ARI conditions for the Naranja library. These chillers included a factory mounted and piped shell and tube desuperheater to reclaim the discharge superheat and put it to useful work. Dunham-Bush also supplied (2) vertical central station air handlers per library with a hot water reheat coil in series with the chilled water cooling coil. The air handler cooling coils were designed for an 80/67°F entering air temperatures and 52.4/52°F leaving air temperature. The reheat coils were designed for a 52.4°F entering air temperature and leaving temperature of 70°F.



The cleanable shell and tube desuperheaters were designed for 33.1 GPM with 105°F entering water temperature and 125° leaving water temperature. When using the superheat in an air conditioning system you can produce free hot water via the shell and tube desuperheater and supply this hot water to the central station air handler reheat coils to achieve the humidity level required for the application with no additional energy input. The heat reclaimed from the desuperheater can also be used for domestic hot water. When removing the superheat from refrigeration cycle and putting it to useful work as outline above, the energy efficiency of the chiller increases with resulting in a decrease of

kilowatt consumption as shown in illustration A on reverse side. The desuperheater eliminates the added capital cost of a hot water system or other energy consuming system to produce hot water when the chiller is providing it for free.

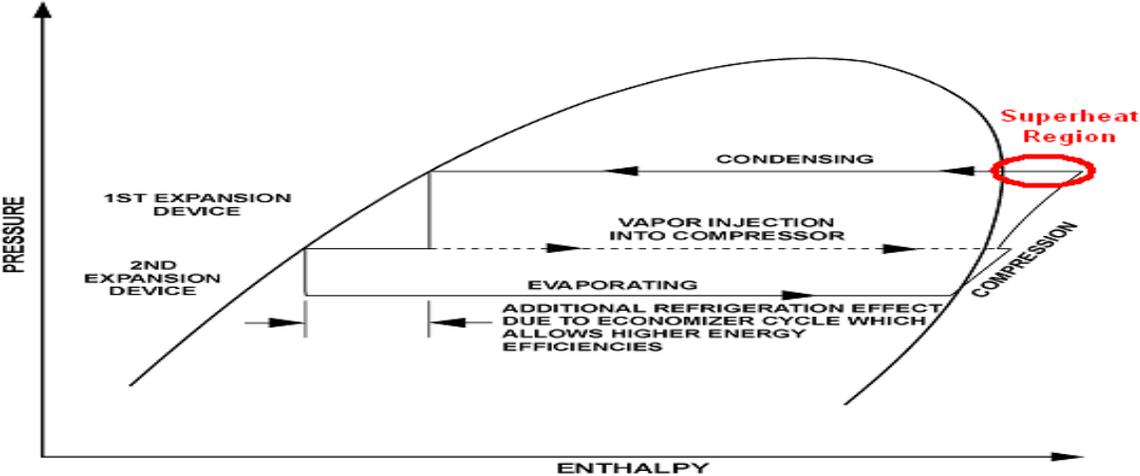


Illustration A