

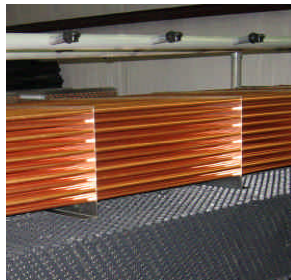
Thermal~Flow

The Total Concept Energy Conservation Company

ThermalFlow - Commercial Products “Demand Buster” series **Fluid-Coolers and Evaporative Condensers**

*It's no accident that large commercial buildings utilize water-cooled air conditioning systems. Typically water-cooled systems have a 40% to 60% efficiency advantage over air-cooled air conditioning equipment. Water-cooled equipment utilizing Cooling towers, and Evaporative condensers have been utilized mainly in large commercial chilled water applications. This long proven technology does not exist in the light commercial applications that dominate the commercial market. Most light commercial buildings utilize roof top air-cooled “package unit”, they are inexpensive and easy to install. The downside is that the units experience excessive heat due to the roof top installation. The “heat island” effect with all of the radiant heat energy on the roof makes the unit suffer additional efficiency and capacity losses. In most sun-belt desert applications the air-cooled roof top units run at a net **6 EER** using **2 kilowatts per ton/hour**. A water-cooled roof top unit under the same desert conditions can run at a net **14+ EER** using **.85 kilowatts per ton/hour**. **Up to 60% savings over air-cooled systems.***

ThermalFlow has developed a retrofit application (Evaporative Sub-Cooling) that converts air-cooled roof top units into a Hybrid Air/Water cooled system. The reliable failsafe design will operate in the air-cooled mode only and in the more efficient air/water cooled mode. The ThermalFlow “Demand Buster” line of cooling towers (closed circuit and evaporative condensers) are the only units on the market that are light enough to be installed on a typical roof with out structural upgrades.

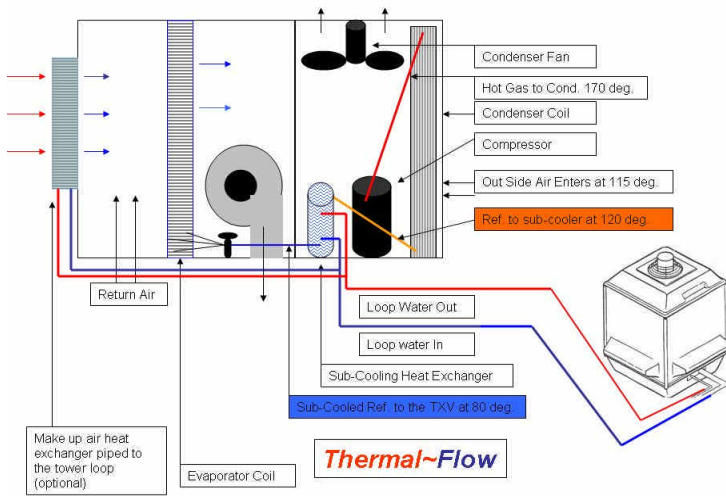


The most energy efficient feature of both the evaporative condenser and the fluid cooler versions is the all copper tube bundle mated with a full evaporative media deck. No other manufacturer in the industry utilizes both a copper bare tube bundle and media in one machine. The media provides full phase change capacity added to the evaporative surface area of the generous tube bundle. The combination results in significant fan and pump energy savings. The cooler water temperature made possible by the media dramatically reduces the scaling potential and allows the tower to handle the minerals with no chemicals, utilizing a simple pre-programmed auto purge/clean function. The fans provided by ThermalFlow use electronically-modulated motors (ECMs) that vary the fan speed to maintain the leaving water temperature or refrigerant temperature at the desired level regardless of the heat load. The modulating fan control optimizes operating efficiency and evaporates only the minimum amount of water to handle the load.

The Evaporative Sub-Cooling Application:

At ThermalFlow, we have adopted the sub-cooling strategy to enhance the operating efficiency of any air-cooled air conditioning or refrigeration system. We utilize our very efficient lightweight evaporative fluid cooler (closed circuit cooling tower) in a closed water-loop to the rooftop units fitted with our sub-cooling heat exchanger. The most dramatic savings are in the hot dry regions of the United States. Our primary commercial application is the conversion of rooftop packaged air conditioners that dominate the light commercial market. In the extreme heat of the desert regions, savings over conventional air-cooled units, utilizing the existing compressors, will reach 35%. With the installation of downsized compressors an additional 15 % efficiency gain is available by taking advantage of the additional capacity made possible by the lower

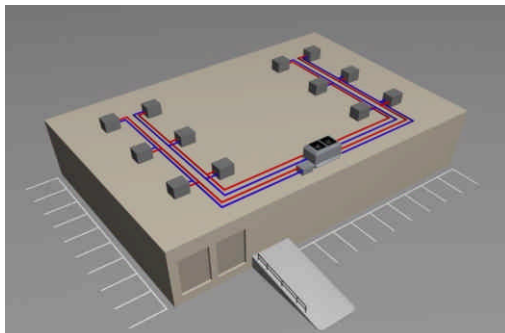
Typical Roof Top Unit Converted to ThermalFlow Sub-Cooling Energy Upgrade



condensing temperature. Many older rooftop units operating in the desert regions are operating at about 1.7 to 2 kw/ton/hr. With sub-cooling and downsizing, power can be reduced to 0.85 to 1 kw/ton/hr.

The fluid cooler is installed on the roof and a simple insulated PVC piping loop will move the glycol/water to the rooftop units. The refrigerant is removed and the heat

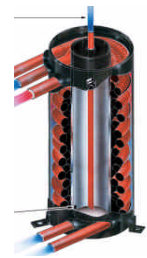
exchanger installed in the refrigerant circuit and re-charged. The water connections are completed and the system is placed back in operation. The ThermalFlow fluid cooler is fitted with an auto purge system to keep the tower basin free of dirt and minerals. The air intake windows provide a light-blocking feature that keeps direct sunlight from the wet section, thus eliminating the need for chemical algaecides. The sloped water basin is designed to freeze without damage to the tower, thus eliminating energy wasting electric basin heaters and the task of draining the basin before the winter season.



Evaporative Sub-Cooling Application w/ Thermalflow Evaporative Fluid Cooler

Other Fluid Cooler applications:

- Process Heat Rejection
 - Hybrid Geothermal
 - Refrigeration Racks
 - Slab Cooling
 - Closed Loop Condensing
 - Water Source Heat Pumps
- For more information



Contact: Eco-Smart, Inc. (888)329-2705