

Legacy Patented Economizer System - Introduction

What is an Economizer?

The term Economizer, as used in the Heating, Ventilation, Air-Conditioning (HVAC) industry outlines the process of using a readily available cooling medium such as outdoor air, earth (Geothermal) or a cool body of water (such as a lake) to exchange heat at a low cost. The ultimate goal of Economizer is to reduce, or even eliminate, the need to deploy higher cost cooling systems, such as refrigeration compressors, to achieve the cooling effect. Over the years, US air conditioning manufacturers have offered (Air-Side) Economizers as an option when purchasing roof top package air conditioning equipment. In response to ever increasing electrical grid demand, many municipalities have mandated higher efficiencies on most mechanical cooling equipment. Economizers have historically been a cost effective way to help meet such mandates. With most market indicators trending towards increases in demand for electricity, conservation by the use of Economizers is expected to grow in popularity in the coming years.



Why apply Economizers to chillers?

For many years, fluid chillers have been used for a variety of specialty process applications such as MRI, Lasers, Semiconductors, Fermentation control and even Advanced Military Application deployments. On the climate control side, chillers are commonly used for other Mission Critical applications such as Surgical Centers, Network Data Centers and 911 Dispatch Centers. Compared to standard direct expansion (DX), cooling system chillers can offer enhancements in overall system efficiency while offering very tight temperature control.



Running parallel to popular Air-Side Economizers used in commercial air-conditioning, there is a new emerging market for chiller based (or Wet Side) Economizers. Until recently, deployment of chiller Economizers have been limited to larger tonnage (150 tons and up) applications mainly due to cost of control and maintenance of such systems. In early 2004, Legacy Chiller Systems took a close look at the subject of chiller based Economizers. We found there was a market for deployment of Economizer

technology on small to medium size chiller applications. After three years of product development, Legacy was successfully awarded a US Patent for process chiller based Economizer System.

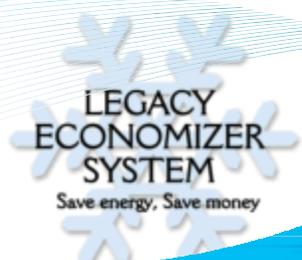
Industry Quotes

"Using a wet side economizer to replace chillers part of the year improved heating, venting, and air conditioning (HVAC) effectiveness—the ratio of power used for IT equipment to power used for cooling—by 85 percent, saving an estimated USD \$144,000 annually. "

Intel
May 2007

WASHINGTON — Natural gas prices jumped to their highest in nearly six months Monday as hot weather across much of the USA led to increased demand for natural-gas-generated electricity.

USATODAY
8-1-2006



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How does the Legacy Economizer System work?

Basic function is relatively simple. As the outdoor ambient temperature drops, the opportunity to save energy by way of an Economizer increases.

For example, with a chiller set-point of 45F, the refrigeration system will cycle normally to maintain set-point. At night or cold days when the outside ambient temperature is 40F (or lower), an opportunity for Economizer deployment (or Energy Savings) exists. As the temperature difference (TD) between set-point and outdoor ambient increases, the chiller's compressor will run less, saving increasingly more energy. At about 20F TD, the Economizer will be 100% deployed and the compressor may no longer be needed. For chiller installations in cold climates, it may be possible for the mechanical refrigeration system to shut down in early fall and not be needed again until spring, running fully on Economizer.



Key Components of the Legacy Economizer System



The Chiller: As we began our quest for a cost effective chiller platform for Economizer deployment, we found that several of our existing lines were a perfect match. Within a relatively short time we made the necessary updates and began testing. As of this paper's publish date the Legacy Chiller Economizer system is fully deployed on our Package Air-Cooled Tank (PACT), Split Air-Cooled Tank (EST) and Packaged Water-Cooled Tank (PWCT) lines. Tonnage in all lines range from ONE TON to TWENTY TONS. In late 2008, Legacy will announce a retrofit chiller Economizer system that will be compatible with any brand package or split chiller application.

The controller: At the heart of the Legacy Economizer system is our intelligent and reliable control system. Legacy patented control software is designed to extract every btuh available. In addition to rock solid reliability, the Legacy Economizer control module is fully BacNet enabled providing optional IP access via hard wired or wireless Internet connections. For the customer with special data needs, Legacy can provide custom configured graphics, on-site or remote trending, remote alarming, BacNet to LonWorks bridging.



Fluid Coolers: Our outdoor fluid coolers (Dry Coolers) are made of only top quality copper tube and aluminum fin materials. Each free standing unit comes with a high CFM outdoor rated fan(s). Our cabinets are made of all heavy duty steel for many years of trouble free operation with proper maintenance. Legacy offers a complete line of Economizer systems with matched fluid coolers. However, customers have the option to purchase their own or even consider Geothermal.



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Additional Resources:

To learn more about the Legacy Patented Chiller Economizer System visit our on-line Knowledgebase at: <http://www.legacychillers.com/kb/default.asp>. Enter the keyword "Economizer" in the search system to find articles, training videos and access to software tools for all Economizer related topics.

Comments & Questions:

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