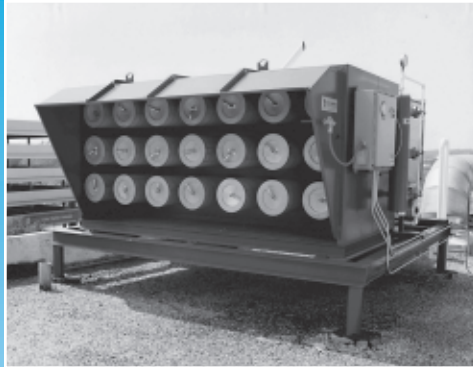


The Cold Facts

Fall 2002

Filtered combustion turbine air inlet cooling unit



Inlet Air-Cooling:

A Great Energy Saving Potential!

Combustion gas turbine inlet air-cooling is fast becoming the energy conservation "thing to do." Here's why: The consumption of energy is growing continuously throughout the world. And it has grown especially fast in the United States. Because of this increasing demand and the very high cost of constructing new power producing plants, facilities have been actively pursuing alternative methods of improving equipment performance. The primary goal is energy at lower cost. With gas turbines being a large element in the production of energy, we look for technologies that allow those machines to run more efficiently. Gas turbine inlet air-cooling is one of these areas of opportunity.

Likewise, combustion turbines used as drivers in industrial settings also create opportunities for large savings. While gas turbine inlet air-cooling is not a new concept, the industry is finding tangible ways to use this method of cooling to increase their turbine capacity or they are ordering smaller turbines to do the same job by employing inlet air-cooling.

On a recent project, RSC was evaluating the use of a turbine to drive a centrifugal compressor for a large natural gas recovery system. After analyzing the effect of cooling the inlet air, we were able to select a smaller gas turbine, which in turn reduced the first cost of the system by nearly a million dollars.

Inlet cooling systems are purchased specifically for increasing the power capacity of gas turbines during the heat of the day, when the largest demand for power occurs. As an example, for every 1° F in temperature reduction by inlet cooling, a gas turbine recovers 0.45% in capacity.

There are many ways of cooling this inlet air. A few of the most common are thermal storage, direct refrigerant or side-port loading. Thermal storage, also not a new concept, is done by making and storing ice in the cooler times of the day or when the electric demand charges are lowest. Then, during the warmest part of the day, the stored ice can be used to cool the inlet air.

Inlet cooling offers an economical means of increasing capacity on a combustion turbine, particularly when the operating air temperatures are high. One last thought: the typical paybacks on the initial investment for inlet cooling is less than 18 months.

—Vince Orlando
President, RSC International

First There Was Ammonia; Then CFC, Then HCFC; And Now There Is Ammonia!

We suppose by now everyone is tired of hearing about the "depleted ozone layer." Well, an article in a trade journal, by David Fahey, Ph.D., of the National Oceanic and Atmospheric Environmental Research Labs, states that by 2050 it is expected that the ozone layer will have regenerated itself to a 1980s level. This is being brought about by the phase-out of the CFCs. Hooray for us!

But...the article goes on to say that the other problem—global warming—has not improved, and in fact has gotten worse. You see, the HCFC replacements for the CFCs are just as harmful as the CFCs were, as it relates to global warming.

Now, many of us, in jest, have said we could stand just a little more of this "global warming" when it's bitter cold out in the winter. However, we all realize that the problem is truly serious. The eco-system can be unbalanced by global warming, which would dramatically affect all of us.

HCFCs are not the only chemicals that impact global warming. There is carbon monoxide and a few others that account for the lion's share of the problem. In 1997, in Kyoto, Japan, a conference was held to formulate a method of reversing the global warming trend. Unfortunately, few countries have agreed to the terms of the accord, including the United States.

So where does this leave us with regard to the refrigerant of choice? Well, why not consider ammonia? It's self-alarming. It was one of the first refrigerants. It's a natural product of nature. It does not contribute to ozone depletion. And, it has a global warming percentage of zero. From time to time we are all asked why we use ammonia. These are just a few of those reasons.



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Replacement Compressor Microprocessors

Do you have one of the older compressor micro units that is losing the screen display? Or, do you have a screw or reciprocating compressor that is still operated by mechanical pressure switches and thermostats? If you do, you can economically upgrade to a microprocessor controller. The RSC compressor micro provides the latest control capabilities in a low cost package with a LCD screen operator terminal that will not fade over time. *The basic system features:*

- Microprocessor controlled for speed and accuracy
- Basic unit provides the capability of 16 inputs and 16 outputs with built in hand-off-automatic switch and status light for each output
- Built in LCD display unit to enter set points and view operating parameters

The system typically monitors:

- Discharge pressure and temperature
- Suction pressure and temperature
- Oil pressure
- Oil filter differential pressure
- Oil temperature
- Slide valve position
- Compressor motor amps
- Or other inputs on request

The software features:

- Self adjusting load/unload speed
- Compressor always starts unloaded
- Automatic restart delay - user adjustable
- Temperature alarm set points (upper and lower)
- Pressure alarm set points (upper and lower)
- Latched alarms
- Motor force unload set point

Optional features:

- Alarm dialer, dials out to three phone numbers
- Strobe light/horn alarms for remote mounting
- Refrigerant gas leak detector monitoring and alarm

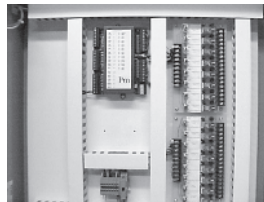
The system may be expanded later to include:

- Compressor staging
- Evaporator defrosts with temperature control.
- Condenser (head pressure) control
- PC workstation with dynamic graphic display.

All systems are manufactured to UL-508 and have the appropriate UL sticker attached. For more information contact your RSC sales representative.



External view of the replacement or upgrade microprocessor control panel.



Interior view of the microprocessor control panel.

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