



EXCLUSIVE FEATURES

# The ROI of the Pool Water Heating Option

Since energy recovery dehumidifiers for indoor pools were invented in the 1970s, they have always provided free pool water heating.

This feature is simple in principal: refrigerant gas gets hot as its pressure increases inside the compressor. This hot gas now has a lot of heat that can be recycled. At the same time, the pool has a constant need for heating to make up for energy lost through evaporation. Therefore, it's relatively simple to create a refrigerant-to-water heat exchanger that can route some of the energy from the hot gas and put it into the pool water. When implemented correctly, payback is very rapid and can significantly reduce energy costs.

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## CASE STUDY BRIEF

The City of Guelph received a \$20,572 utility incentive from Union Gas Ltd. for its use of a 50-ton Seresco dehumidifier at its Victoria Road Recreation Centre. Installed in 2016, the NP-050 heats, cools and dehumidifies the 22,500-square-foot natatorium area of the facility, which features a 50-metre competition and 25-metre teaching pool. A gas use reduction of about 3.6 million cu. ft. per year is achieved thanks to the dehumidifier's free pool water heating feature plus an exhaust-air heat recovery system.

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In another example, let's take the real-world case of a small pool facility in New Jersey with a 7-ton dehumidifier. Like many such pools, this one decided to invest in energy efficiency by getting a pool water heater with their dehumidifier. The estimated annual energy savings is about \$1,897 a year, with a natural gas rate

of \$0.75/ccf. That means payback happens in less than a year — about four months, for the price of the option alone. When you factor in piping and other installation costs, the payback happens in about eight months. Over a 15-year lifespan for the equipment, savings would compound into at least \$28,455!

Because of the typically rapid payback, the pool water heating option is very popular and is currently in use for thousands of pools across North America.

There are some other great reasons to opt for this feature that only improve the benefits.

## Better ROI and Tools

There are tools now to understand the ROI of purchasing a pool water heating option with a dehumidifier. Any indoor pool dehumidifier manufacturer should be able to assist calculating the return on energy savings, by considering your local energy (usually gas) rates and how much energy the dehumidifier can recycle into the water. When reviewing energy savings contributed by the pool water heating option, it's important to consider total lifetime savings as well as first-year payback when considering this option. A good-quality indoor pool dehumidifier can last 15 or even 20 years — so it's only prudent to consider future savings in the longer-term.

Besides your energy savings due to heat being returned to the pool, the feature improves efficiency on the whole dehumidifier. When the coaxial is in use, condensing pressure in the dehumidifier is lower and this translates to higher overall efficiency. Lower condensing pressures can net as much as 20% more performance out of the

same compressor. When these two energy-savings are considered, many facilities could save a few thousand dollars a year, and more over the lifetime of the unit. Having a pool water heat exchanger also creates another safety for the unit during hot spells, as it doesn't have to rely entirely on an outdoor heat exchanger to condense refrigerant; it can also bleed more heat into the pool as a backup. Because of the high specific heat capacity of water and the heat lost to evaporation, bleeding more heat into the pool to avoid a head pressure trip doesn't raise the temperature of the pool and keeps the unit running smoothly even during an abnormally hot day.

Also, to further improve efficiency, operators can get an optional sensor and control logic that can send a signal to turn off the booster pump when pool water heating mode is not active. This contributes to overall payback on the pool water heating option, as the booster pump will only be activated when it is actually needed.

## Designing a Better Coaxial

The standard pool water heat exchangers (called coaxials) can be vented or non-vented. Vented is a better option because it prevents water from getting into the refrigeration circuit in case there is a breach. It is a simpler repair job compared to the cost of purging the entire circuit completely of water and then recharging it with fresh refrigerant.

Seresco has taken it to another level with a true industry-first: a coaxial made of titanium, which is available as an option with NE Compact Series dehumidifiers from 2 to 16 tons. The titanium, full-flow pool water

heater solves every one of the main challenges associated with dehumidifier pool water heating:

- The coaxial is titanium and is ultra-resistant to corrosion.
- It is a full-flow heat exchanger, meaning piping it is as simple as cutting into the main circulation line, sending the entire flow into the unit and then sending all of the flow back. No booster pump is necessary. Operation is more stable when switching modes because of the higher flow. This is a tremendous improvement over standard designs that require more complicated piping work to install correctly. Payback is more rapid due to the simpler and lower-cost piping.
- Because it's full-flow, that means the heater can be fully modulating up to 100% of the compressor waste heat.

## Conclusion

- Adding a pool water heat exchanger to an indoor pool dehumidifier is typically a sound investment that offers rapid payback in under a year.
- Energy savings are significant and the operator also gets a true improvement to dehumidifier efficiency.
- An improved design that is only available with Seresco's NE Compact Series solves the last main difficulty involved with this option, by making the piping extremely simple and improving corrosion resistance with titanium.
- As shown in the two real-world examples in this white-paper, significant lifetime energy savings await facilities of large and small size that make this modest investment in adding a pool water heat exchanger to their unit.

The National Accounts division of Dehumidified Air Solutions offers indoor pool owners of hotels, athletic facilities and swim schools with multiple facilities exclusive membership benefits for dehumidification equipment, parts and service.



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