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salgenx-saltwater-flow-battery-grid-scale-thermal-cogeneration-storage

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Salgenx

SaltWater Flow Battery Cogeneration

This webpage QR code

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Salgenx SaltWater Flow Battery Thermal Storage Applications

PDF Version of the webpage (first pages)

With a COP of 5, what are the energy savings of a heat pump when grid power is at $.15 per kwh ?

A heat pump with a coefficient of performance (COP) of 5 means that for every unit of electrical energy input, the heat pump can produce 5 units of heat energy. This means that a heat pump with a COP of 5 is five times more efficient at producing heat energy than an electric resistance heater, which has a COP of 1.

To calculate the energy savings of a heat pump, you need to know the cost of the electricity and the amount of electricity used.

If the cost of grid power is $0.15 per kWh and the heat pump is used to generate 1kWh of heat energy, the savings would be:

1kWh x $0.15/kWh = $0.15 (cost of electricity to generate 1kWh of heat energy with an electric resistance heater)

1kWh / 5 (COP) = 0.2kWh (amount of electricity used to generate 1kWh of heat energy with the heat pump)

0.2kWh x $0.15/kWh = $0.03 (cost of electricity to generate 1kWh of heat energy with the heat pump)

Therefore, the energy savings with a heat pump would be:

$0.15 - $0.03 = $0.12

It's worth noting that this is a simplified calculation and that the actual energy savings will depend on a number of factors, such as the specific heat pump, the temperature of the heat source, and the specific application. Additionally, the savings will depend on the price of electricity, which can vary depending on the location and the time of day.

Overall, heat pumps are highly efficient devices that can provide significant energy savings, especially when the grid power is expensive.

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CavGenX

The turboshaft heat pump. This device can be used in conjunction with the Salgenx battery for cogeneration - storing hot or cold thermal energy in the saltwater electrolyte.

Available for licensing.

The Concept: Combining a common shaft drive turbine to a compressor for heating, cooling, and hydraulic drive pressure is unique in its ability to serve multiple functions simultaneously.

Purpose: Provide cooling and hydraulic drive power.

Goals: AI processor cooling and hydraulic drive power.

How Does it Work ? A electric motor starts the common shaft compressor. Liquid working fluid is flashed to pressurized vapor by a cavitating disc. The vapor is then heated for more pressure. The pressurized vapor is then expanded through a common shaft turbine. The resulting shaft rotation drives the forward cavitating compressor, a hydraulic pump, and a feed pump. The vapor is then condensed (a cooling process) and can be used for cooling. In this ORC process, the evaporator is the thermal stage between the compressor and turbine. Evaporator heat can be provided by waste heat, solar thermal, AI processor heat, magnetic induction, conventional fuels, and more.

About: Infinity Turbine invented the Modular Block in 2004 and uses it for applications in Organic Rankine Cycle, cooling, and gas to liquid applications. Infinity has been developing ORC turbines, systems, and applications since 2008. In 2015, Infinity built production CO2 closed loop systems. This application is a synergy of thermal and power processing using the experience, knowledge and First Principles for turboshaft processing power.

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The Hidden Cost of AI: How Every Query Contributes to Water Scarcity

Note: The Cavgenx system is designed to be integrated into the Salgenx battery, which can be used as a heat sink for AI data center cooling and battery backup.

In our digitally-driven world, artificial intelligence (AI) has become an integral part of our daily lives, from voice assistants and recommendation algorithms to chatbots and language models. We often use AI systems without realizing the environmental impact they may have. A recent study conducted by the University of California, Riverside, sheds light on a concerning aspect of AI technology: its hidden water footprint. Each time you run a ChatGPT artificial intelligence query, you unknowingly contribute to the depletion of our already overstressed freshwater resources.

The Water Footprint of AI

The research from the University of California, Riverside, has revealed a startling fact: running AI queries that rely on cloud computations in data processing centers consumes significant amounts of freshwater resources. With every 20 to 50 queries, approximately half a liter (around 17 ounces) of fresh water is lost in the form of steam emissions. This might not seem like much on an individual basis, but the cumulative impact of billions of AI queries worldwide is a cause for concern...

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Infinity Tesla Disc Pump and Turbine with Radial Impeller Option

Included with the Salgenx license.

Infinity is now offering its experimental Tesla disc pump and turbine package. It also includes a radial pump/turbine impeller. This is experimental.
The 6 inch (152.4 mm) diameter disc pack can be swapped out for any type Tesla disc for optimizing pump according to liquid viscosity.
Pump discs are mounted on a keyed common shaft to a magnetic coupler which allows a outside pump motor (with magnetic coupler) or external generator.
Prototype pump discs or impellers can be 3D printed for this type of Modular Block assembly housing. Typical blocks are machined from aluminum (for pumping or expander operations) or HDPE for just pumping.
The pump housing is good for pressures lower than 300 PSI and less than 100 C. If higher pressures are desired, then a high strength material magnetic coupler block needs to be designed and manufactured (something like carbon fiber).

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Thermal Applications

Salgenx S3000 grid power mining and thermal savings chart.

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